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PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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TRADE NAME	MODEL	SET AND FOLDER No.
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Ampro	745 "Career" Recorder	333-3
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Zenith	Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y20, U) Tel. Rec.	333-17
ADMIRAL	T101-2-3-4, T105AL, 6AL, 7AL, TS101-2-3-4, TS105AL, 6AL, 7AL Chassis 14YP3B	333-18-S
General Electric	9T001, 9T002 ("T" Line)	333-18-S

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 14 IN SET 326		ZENITH MODEL ROYAL 500 (Ch. 7XT40, 7XT40Z, 7XT40Z1)
	Zenith Royal 500 (Ch. 7XT40), early version was covered in Photofact Folder 14 — Set 326. Chassis 7XT40 (late version) 7XT40Z, and 7XT4Z1 are added with the publication of this bulletin.	
	A complete schematic for Ch. 7XT40 (Circuit #2) is given in Fig. 1. A complete schematic for Ch. 7XT40Z is given in Fig. 2. A complete schematic for Ch. 7XT40Z1 is given in Fig. 3. Alignment procedure will be essentially the same as given for Ch. 7X40 (Circuit #1) in Photofact Folder 14 — Set 326.	
	CHASSIS IDENTIFICATION Each chassis has a color identifying code on the battery compartment just above the battery installation instruction label. The color code is as follows: Ch. 7XT40 (Circuit #1), black code dot. Ch. 7XT40 (Circuit #2), maroon code dot. Ch. 7XT40Z, red code dot. Ch. 7XT40Z1, green code dot.	

PRODUCTION CHANGES
BULLETIN 170

PRODUCTION CHANGES
BULLETIN 170

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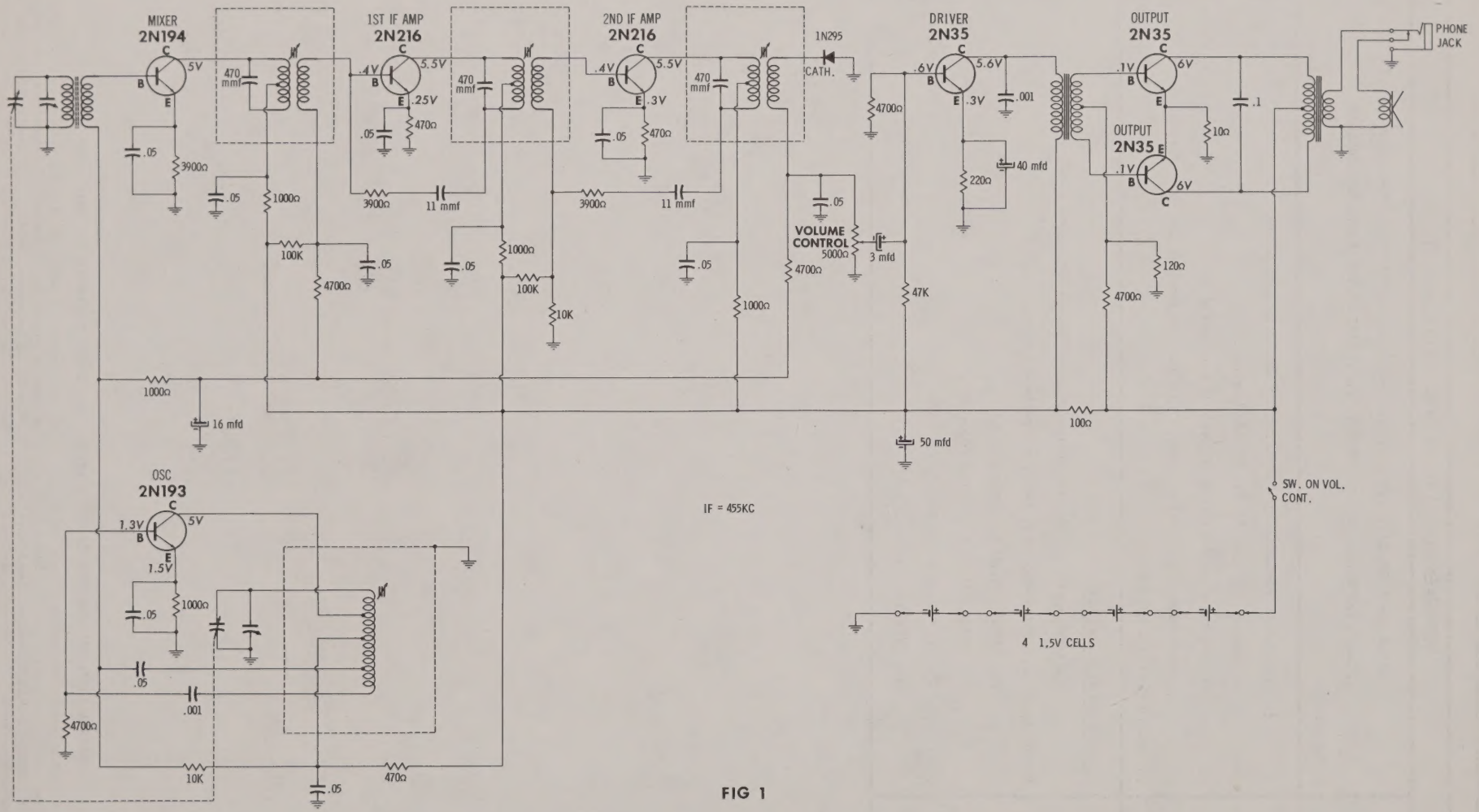
MIXER
2N194
1ST IF AMP
2N216
2ND IF AMP
2N216
1N295
CATH.
DRIVER
2N35
OUTPUT
2N35
OUTPUT
2N35
PHONE JACK
OSC
2N193
VOLUME CONTROL
5000Ω
IF = 455KC
SW. ON VOL. CONT.
4 1.5V CELLS
16 mfd
50 mfd
3 mfd
40 mfd
470 mmf
11 mmf
100K
10K
47K
100Ω
120Ω
220Ω
10Ω
.05
.001
.1
1000Ω
3900Ω
4700Ω
470Ω

FIG 1

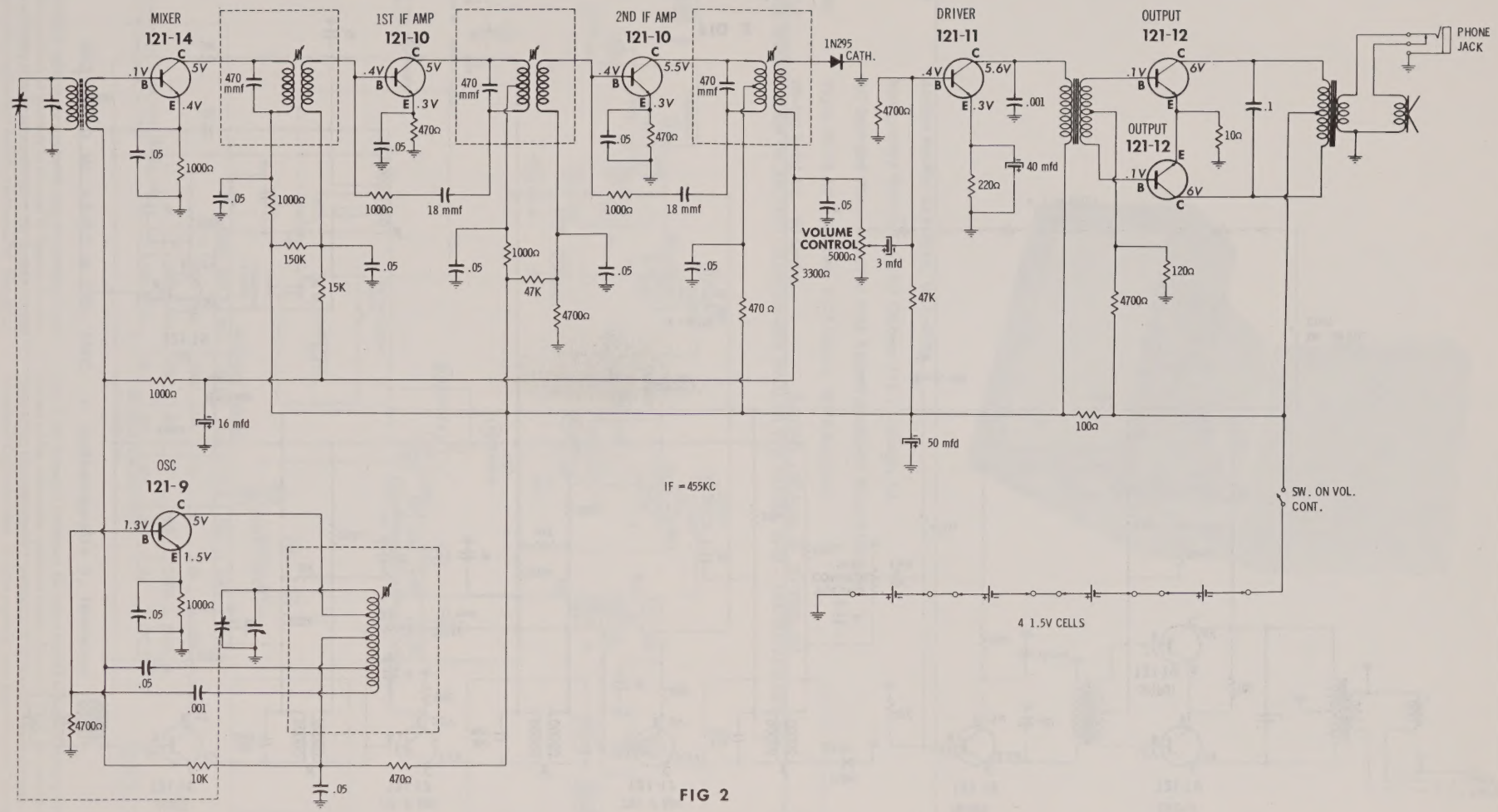

FIG 2

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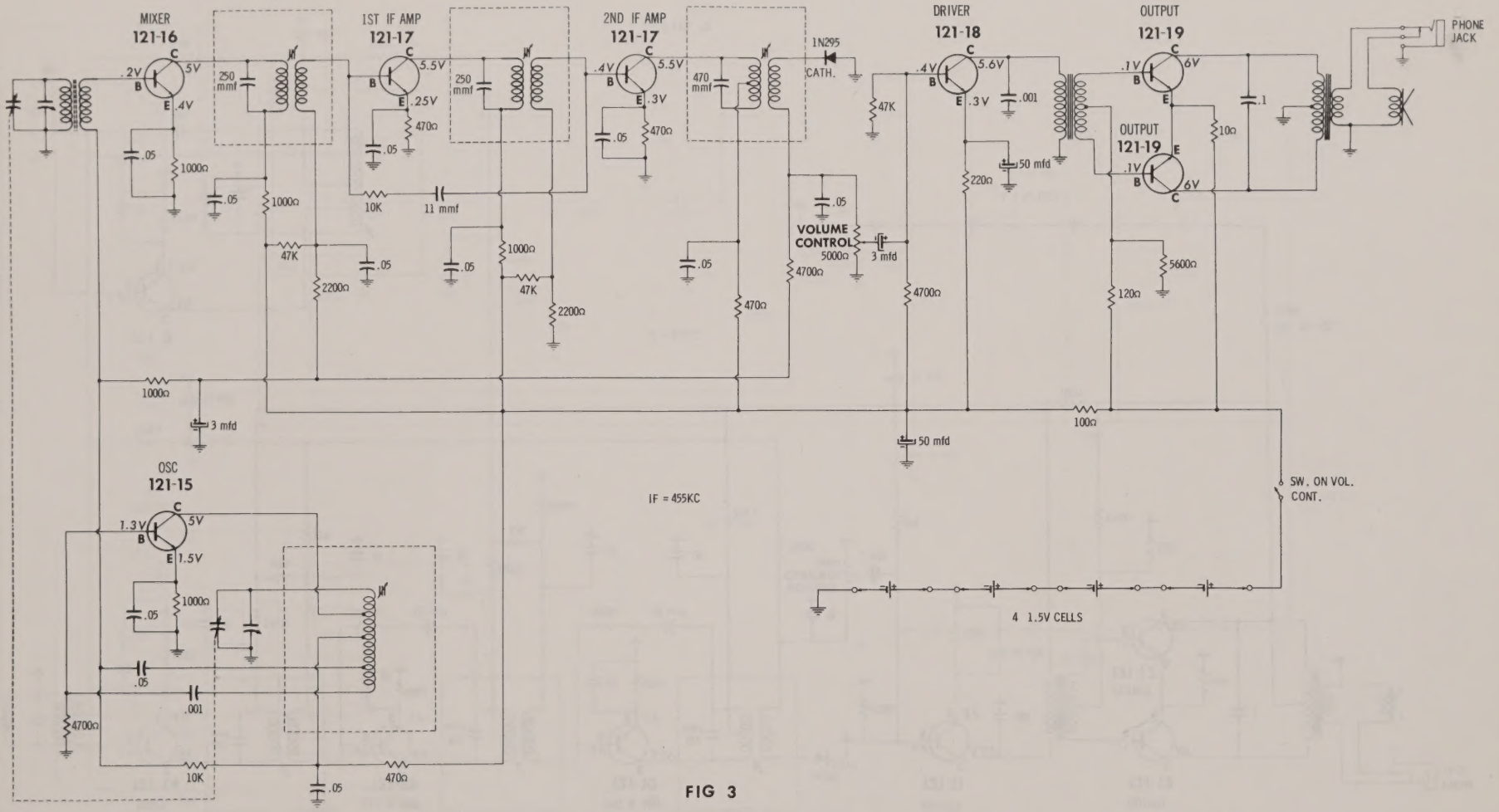
MIXER
121-16
1ST IF AMP
121-17
2ND IF AMP
121-17
DRIVER
121-18
OUTPUT
121-19
OUTPUT
121-19
PHONE JACK
1N295
CATH.
VOLUME CONTROL
5000Ω
OSC
121-15
IF = 455KC
SW. ON VOL. CONT.
4 1.5V CELLS
3 mfd
50 mfd
100Ω
1000Ω
2200Ω
47K
10K
11 mmf
470Ω
4700Ω
220Ω
120Ω
5600Ω
10Ω
.05
.001
.1
250 mmf
470 mmf

FIG 3

AIRLINE
MODELS GAA-954A, GAA-1000A

AIRLINE
MODELS GAA-954A, GAA-1000A

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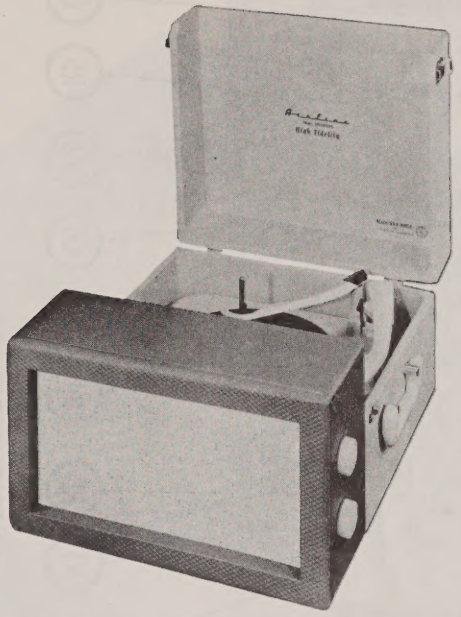
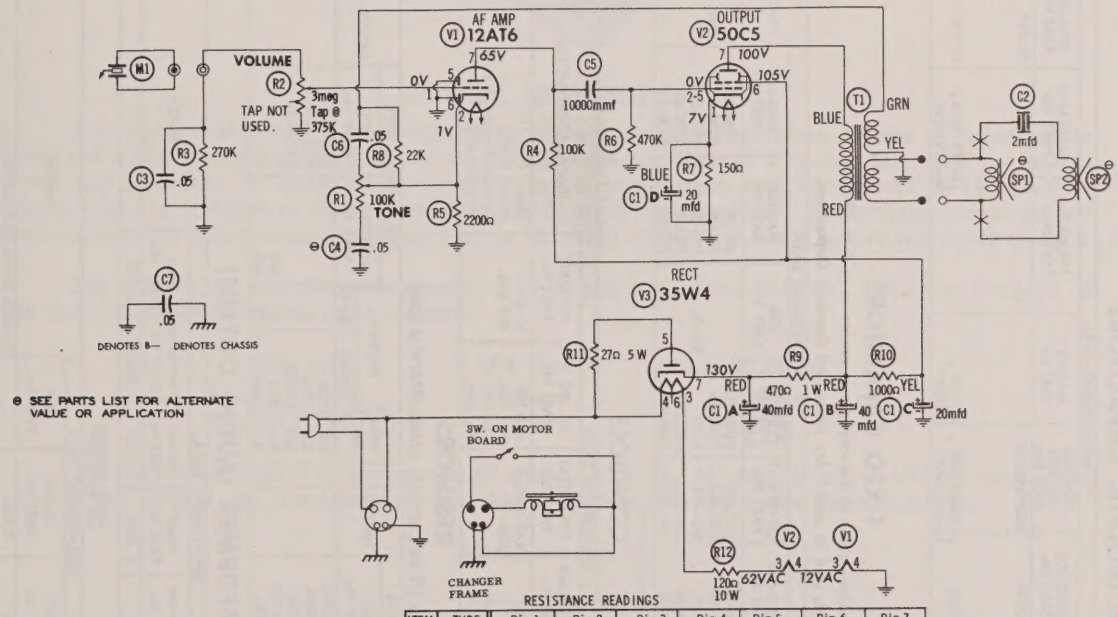
AIRLINE
MODELS GAA-954A, GAA-1000A



TRADE NAME	Airline Models GAA-954A, GAA-1000A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (THREE)	Types 12AT6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER-SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302-FOLDER 12



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	0Ω	2000Ω	12Ω	0Ω	0Ω	0Ω	†100K
V2	50C5	150Ω	470K	62Ω	12Ω	470K	†1500Ω	†630Ω
V3	35W4	NC	NC	180Ω	225Ω	250Ω	NC	10K

† NC MEASURED FROM PIN 7 OF V3. NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	1019	E58C34	BBRQ44315C				R2199†
B	40	150							
C	20	150							
D	20	25							
C2	2	50	830 (Note 1)	RE1034	BBR4-50T * BBR4-50T	TC30 * TC30		MT-1504 * MT-1504	R2198†

* Connect negative leads together.
† Non catalog item.
Note 1: Non polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C4	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	Note 2
C5	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C7	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 2: Some versions may use .1MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100K	½	416	AB-43	A47-100K-S	Q11-228	U-415	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
R2A	3Meg	½	401E	ABT-79		Q13-140		Volume-Tapped@ 375K
B	Shaft		Not Req.	AK-4		Not Req.		Attach to R2A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE PART No.	IRC PART No.	NOTES
R3	270K			BTS-270K	
R4	100K			BTS-100K	
R5	2200Ω			BTS-2200	
R6	470K			BTS-470K	
R7	150Ω			BTS-150	
R8	22K			BTS-22K	
R9	470Ω	1		BTA-470	
R10	1000Ω			BTS-1000	
R11	27Ω	5	542		
R12	120Ω	10	625		

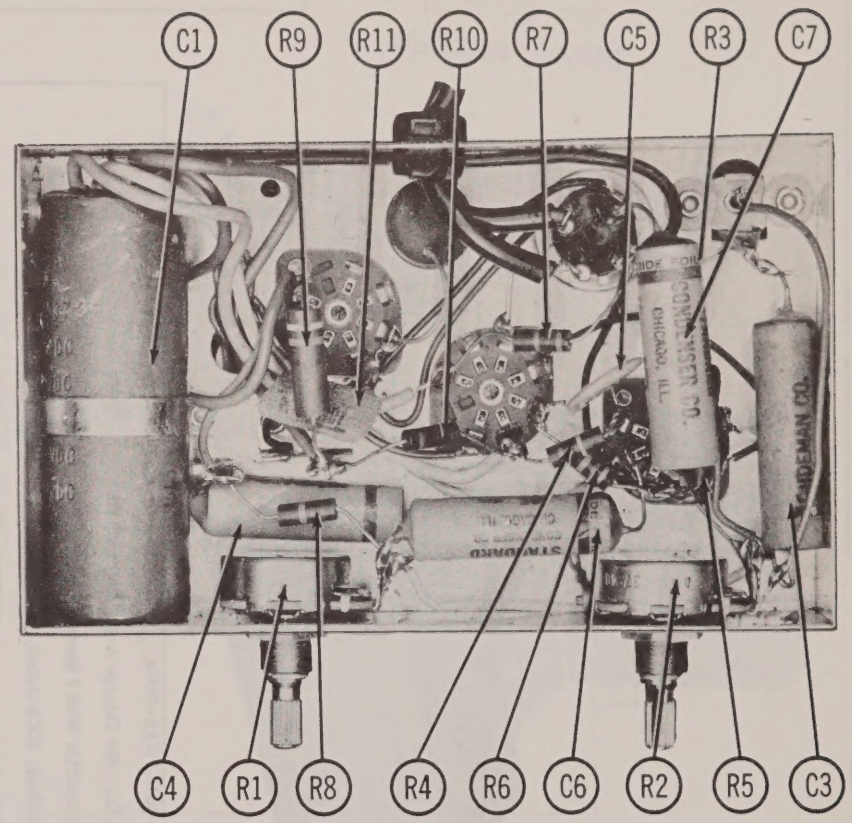
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4K	3-4Ω	1209C	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	7"	PM	3-4Ω	2629	7A21	228S1	Used in Model GAA-1000A
SP1	5"	PM	3-4Ω	2626	5A21		Used in Model GAA-954A
SP2	3½"	PM	11Ω	2630	3A15T		Used in Model GAA-1000A

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	60-47			46-T	0-1 or S-1 and 0-3	

ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	61-48 (78RPM Needle)	†C-143 or ♦C-143D	†CR-55 or ♦CR-55D	† W-64S or ♦W-64D	† Jewel ♦ Diamond
	61-47 (33 1/3-45RPM Needle)	†A-142 or ♦A-142D	†CR-55LP or ♦CR-55LPD	†W-64MGS or ♦W-64MGD	

PROPERTY OF
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DENVER, COLORADO

AMPRO
MODEL 745 "Career"

AMPRO
MODEL 745 "Career"

GENERAL INFORMATION

The Ampro Model 745 is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time of a reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker or an external speaker through use of the Speaker Jack.

The Model 745 has two tape speeds, 3 3/4" and 7 1/2" per second. Using both tracks of the tape the recording time is as follows.

Size Reel	3 3/4" Speed	7 1/2" Speed
5" reel (600 ft.)	1 hour	1/2 hour
7" reel (1200 ft.)	2 hours	1 hour

This unit is designed to operate on 60 cycle, 115 volt, AC supply only. Before connecting to your line supply, be absolutely certain that it agrees with the above specifications.

Manufactured by:

Ampro Corporation
1345 Diversey Parkway
Chicago 14, Illinois

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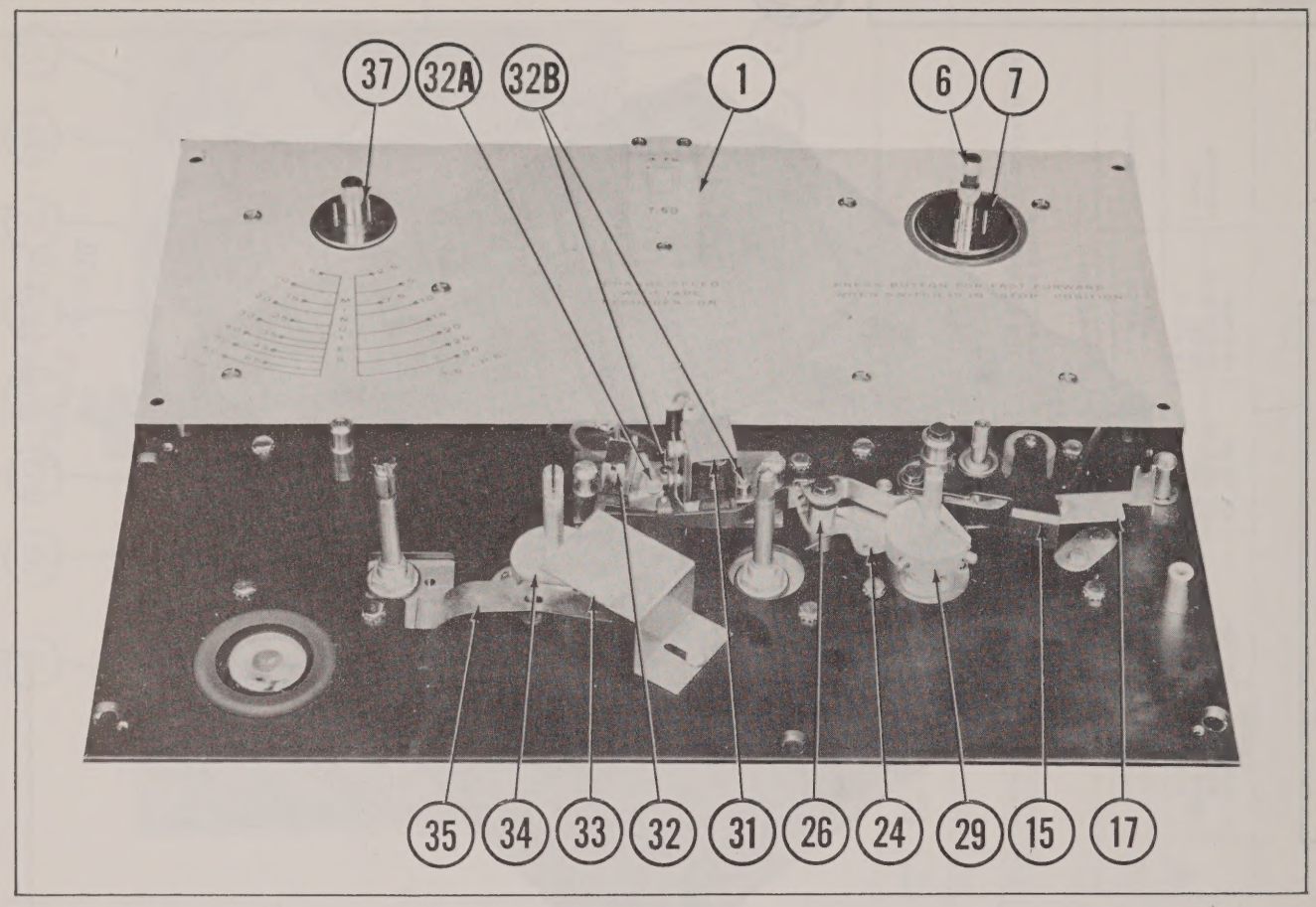


Figure 1

OPERATING INSTRUCTIONS

Preparation For Operation-

1. Remove the AC power cord 5" reel of tape, empty reel and microphone from the rear storage compartment.

2. Plug the AC cord into a convenient wall receptacle of the proper rating.

3. Be sure the Play-Stop-Rewind control is in "stop" position and the Play-Record control is in "play" position.

Speed Change Knob-

Select tape speed with the unit on. Moving switch upward will cause the unit to play at the speed of 3.75, moving switch downward the unit will play at a speed of 7.50. For maximum tape economy or for recording the spoken voice, 3.75 I.P.S. is suggested. The best for music and maximum fidelity is the speed of 7.50 I.P.S.

Threading The Tape-

1. Place a full reel of tape on the left (supply) spindle (37), making certain one of the reel slots catch the protrusions of the pan. Unwind about 14" of tape from the supply reel.

2. Insert free section of tape into the tape slot.

3. Insert free end of tape into one of the three slots in the hub of the right (take-up) reel and while holding the tape in place give the reel two or three turns until the tape is secured.

4. The dull side of the tape should always face away from the operator (rear of unit).

To Record From Microphone-

1. Turn the On-Off Volume control to the right until a click is heard and allow about 30 seconds for the unit to warm up.

2. Insert the microphone plug into the "Microphone" input.

3. Press down "Safety Button" and turn Play-Record control to "Mic. Record" position.

4. Adjust the "Volume" control until the Record Level Eye, green rays almost meet on loudest sounds, recording level is perfect at this point.

5. The "Tone" control does not operate during recording. When recording from radio, set the radio "Tone" control for maximum treble.

To Record From External Radio, TV, Or Phonograph-

1. You may record directly from the speaker by using the special radio-phono connection cord, available as accessory No. 108. (This cord has a telephone-type jack at one end, and two metal clips at the other).

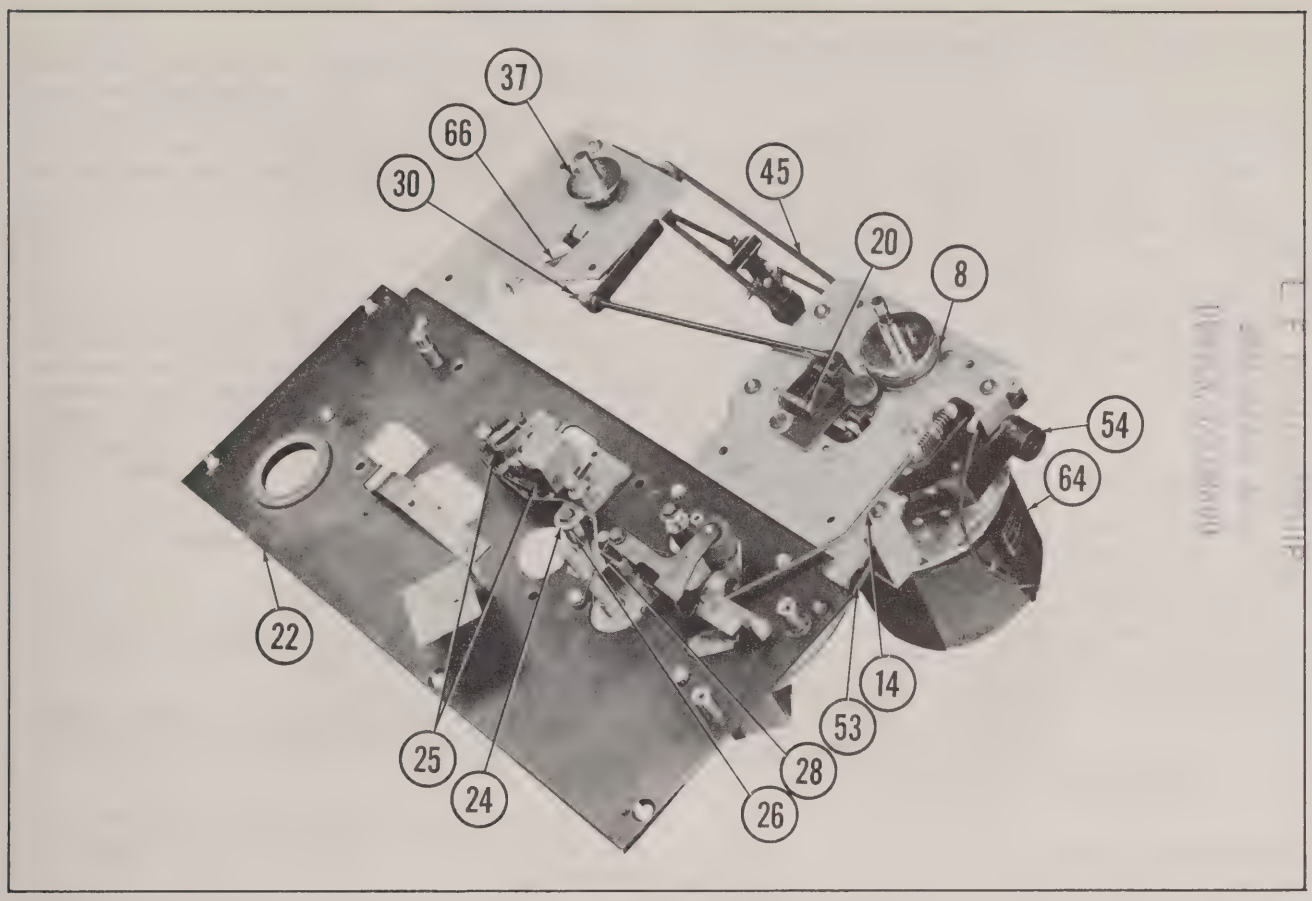


Figure 2

2. Attach one clip to the ungrounded side of the radio, TV or phono speaker coil. The other clip is attached to the grounded side of the coil.

3. Plug the Jack into the receptacle on side of your unit marked "Mic or Phono," and proceed as described under "To Record From Microphone".

NOTE: Remove patch cord after recording is completed.

To Use Second Track-

1. Move Play or Record-Stop-Rewind lever to the "Stop" position when all the tape has wound onto the take-up reel.

2. Remove reel containing tape and place on left-hand supply spindle.

3. Place empty reel on right-hand take-up spindle.

4. Thread tape as previously described.

To Play Recordings-

1. Turn on unit with "Volume" control knob.

2. Thread tape as described under "Threading The Tape.

3. Set the speed change knob (1A) to the speed at which the recording was made.

4. Turn Play-Stop-Rewind lever to play.

5. Adjust "Volume" and "Tone" controls to desired listening level.

6. To stop, return Play-Stop-Rewind lever to "Stop".

Fast Forward Tape Advance-

1. Leave Play-Stop-Rewind lever in "Stop" position.

2. Hold down "Fast Forward Button" (6) on top of right reel spindle (7).

3. Release when tape has advanced to location on the tape you wish to hear or record.

To Rewind-

1. Before rewinding, return Play-Record control to "Play" position.

2. Turn Play-Rewind lever to "rewind". Rewind tape to beginning of your recording and return lever to stop.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Erasing Recorded Material-

When the Play-Record knob (3) is in the "Record" position, the erase head is automatically in operation, erasing any previous recording before a new one is made. You may erase material no longer needed, without recording, by moving the Play-Record knob (3) to "Record" on turning the "Volume" control knob to the minimum volume position just before the recorder shuts off. One track is erased at a time. To erase the second track, reverse the reels and repeat the above operation.

To Use Recorder As A Public Address System-

Plug microphone cord into "Mic. or Phono" receptacle. Turn Play-Record control to "phono-record" position. Be sure microphone is far enough away from speaker to avoid feedback squeal. Volume may be adjusted with Volume control. Mike and/or radio-phono can be simultaneously used for blending of special effects in public address use with Ampro Dual - Input Mixer, No. 133.

ELECTRICAL ADJUSTMENTS

Erase Head Adjustment-

1. Loosen screws located on the left side of erase head and raise or lower head and tilt head as required in order to obtain minimum output.

2. Then loosen screw (32A) and rotate positioning block for minimum output.

3. Tighten screw (32A) and rotate positioning block for minimum output.

4. Check for opposite track erasure if excessive, head is set too low.

Record Head Adjustment-

The record head is mounted on a pivoted plate which is held in place by two filister head screws (32B) located at opposite corners of the plate. Tightening or loosening the screw on the left (viewed from operating position) rocks the pivoted plate thereby changing the angular relationship between the gap and the tape and increasing or decreasing the compression of the spring located under the head of the opposite mounting screw. In order to make an adjustment, thread the recorder with pre-recorded 1 mil alignment tape or a good recorded tape on the machine.

Connect an output meter across the terminals of the elliptical speaker. Switch recorder to "play" position and set the volume control to the 12 o'clock position. Rotate the screw which secures the left side of the plate in order to obtain maximum output from the pre-recorded material. Make a rough adjustment at a tape velocity of 3.75 inches per second the switch to 7.50 inches per second for final adjustment.

NOTE: Watch out for a false peak you may find 3 peaks - be sure to adjust for strongest peak.

Erase Current-

Disconnect the ground lead at the erase head terminal and insert a 10 ohm non-inductive resistor. Connect a VTVM across the resistor. Switch to record and note voltage. Correct voltage will be approximately 0.4-0.5 volts indicating an erase current of approximately 40-50 ma.

Bias Current-

Disconnect lead from record head. Insert 100 ohm non-inductive resistor between red lead and record head terminal and connect VTVM across 100 ohm resistor. Turn volume control to low volume position. Switch to record and measure voltage across resistor. Voltage should be "0.40 - 0.45" volts which is equivalent to a current of "0.40 - 0.45 ma. If bias is not within these limits adjust slug in oscillator coil to obtain correct current.

MECHANICAL ADJUSTMENTS

Erase Interlock Cam Adjustment-

1. Loosen set screw slightly so that cam (34) can be turned on control shaft.

2. Turn shaft to maximum clockwise "Play" position. Rotate cam so that flat surface is parallel to edge of interlock spring (35).

3. Press in on interlock spring, then turn control shaft in order to expose setscrew. Tighten setscrews.

Rewind-Play Or Record Cam (29) Adjustment-

1. Turn control shaft to maximum counter-clockwise (Play or Record) position.

2. Loosen setscrews in cam. Rotate cam so that cam flat is parallel to flat surface of pad actuating arm (24).

3. Raise or lower cam (29) as required in order to locate top face of cam in the same plane as top of arm (24). Tighten setscrews.

4. Place light film of "Lubriplate" on surface of cam which comes in contact with arm (24).

Disassembly Instructions-

1. Take out the four Phillips filister head screws located at the corners of the panel (5). Loosen the two allen setscrews in the "Rewind-Play or Record" knob (3) and remove the knob. Pull off the other three knobs (2). Lift off the control panel (5).

2. Remove three phillips oval head screws which hold speed change control cover (1) in place and lift off cover.

3. Take out ten phillips oval head wood screws which hold metal panels to case.

4. Loosen cable clamp which holds line cord to back of carrying case. Stand recorder on end and pull mechanism out of case.

Takeup Brake Adjustment-

Place "Rewind-Play or Record" knob in "Play"

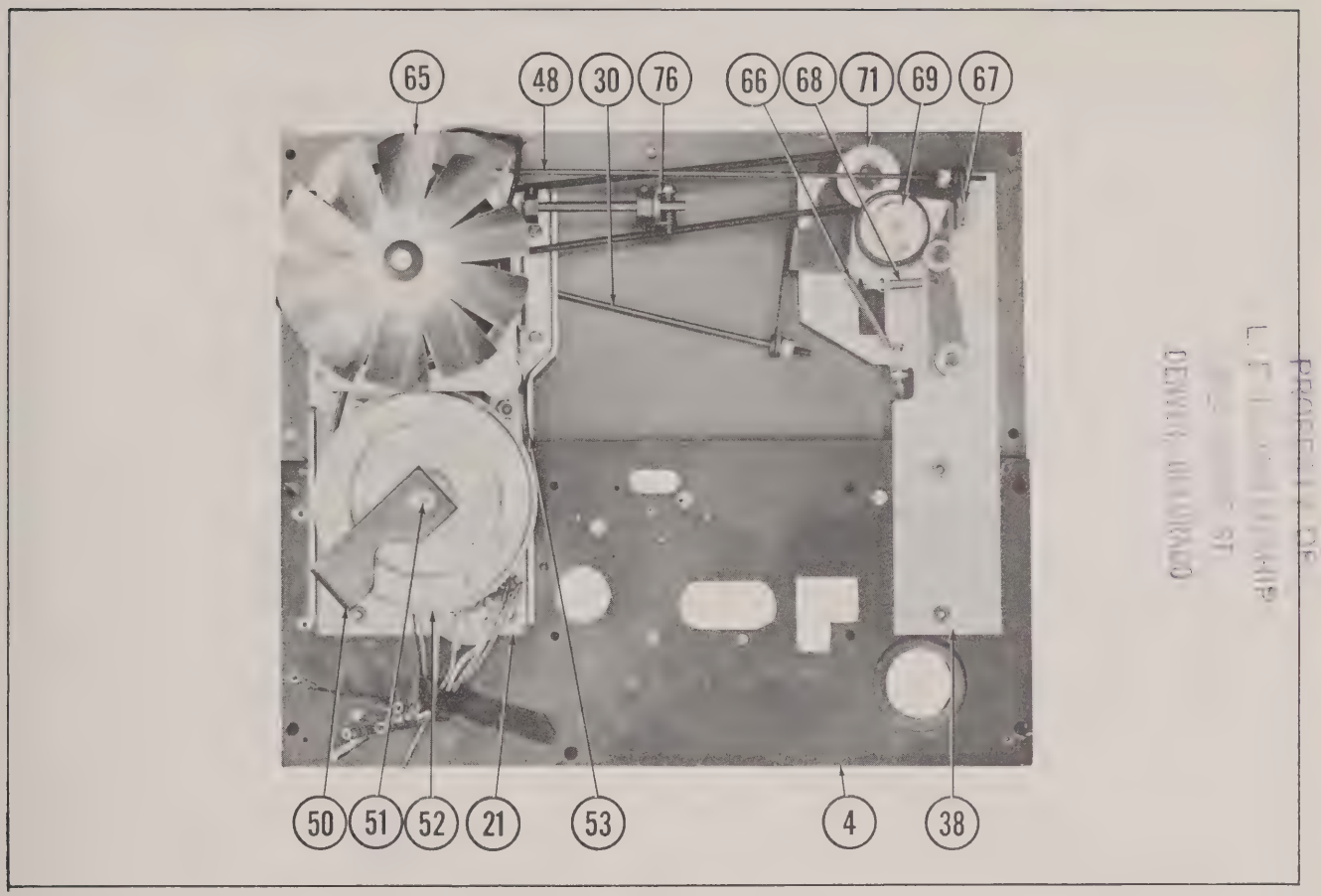


Figure 3

position. Loosen locknut on adjustment screw (19A) and turn screw to provide a clearance of 1/64" between shoe (19) and tire (8). Tighten locknut.

Feed Spindle Brake Adjustment-

Place "Rewind-Play or Record" knob (2) in "Play" position. Loosen double nuts at end of brake rod (48). Adjust nuts to provide a clearance of 1/32" between shoe (67) and tire (70). Rotate feed spindle and check to make sure that eccentricity, if present, does not reduce clearance below minimum value of 1/32". Tighten locking nut.

Instant Stop Link-

Set inner nut of link (14) 1 5/32" from end of link (14). Set outer nut flush with end of link.

Rewind Adjustment-

Place "Rewind-Play or Record" knob in "Play" position. Loosen double nuts at end of pushrod (30). Adjust nuts to provide a clearance of 1/64" between rewind drive belt (45) and knurled section of drum (69).

NOTE: If rewind does not function properly, and the rewind belt (45) is not damaged, the trouble is probably due to excessive take-up tension.

Takeup Adjustment-

1. Cement 8-10" of tape or string to the hub of a 7" reel. Place reel on takeup spindle and hook a spring balance scale (0-8 oz. or 0-16 oz) to the loose end of the tape or spring. Switch recorder to "play" measure the takeup tension-correct tension should be 1/2 to 1 oz.

2. If takeup tensions are incorrect, remove recorder from case. Loosen two setscrews which hold the intermediate drive pulley (47) to takeup drive spindle and pull out spindle assembly.

3. Grasp the spindle by the shank (9), hold spindle in a vertical position with the reel drive pins on top. Hook the spring balance scale to one of the reel drive pins and pull along a line as a right angle to a line thru the center of the spindle post and pin. The "breakaway" tension required to rotate the spindle should be 3 to 5 oz. In order to adjust the tension, invert the spindle and insert the ends of the jaws of a pair of longnose pliers into the two holes in the clutch pressure plate (12). Turn the plate to the right to increase the tension.

NOTE: This adjustment is sensitive when making adjustment, do not turn the plate more than the width of one of the holes between tests.

TROUBLES

Whining Or Scrapping Noise-

1. The recorder is shifted in the case, the bottom end of the motor shaft rubs against the guide sleeve in the bottom cover and produces the noise.

2. Reposition the mechanism in the case and tighten the retaining screws. If the holes in the support blocks are damaged, the best way to make a permanent repair is to inject plastic wood into the hold before inserting the screws.

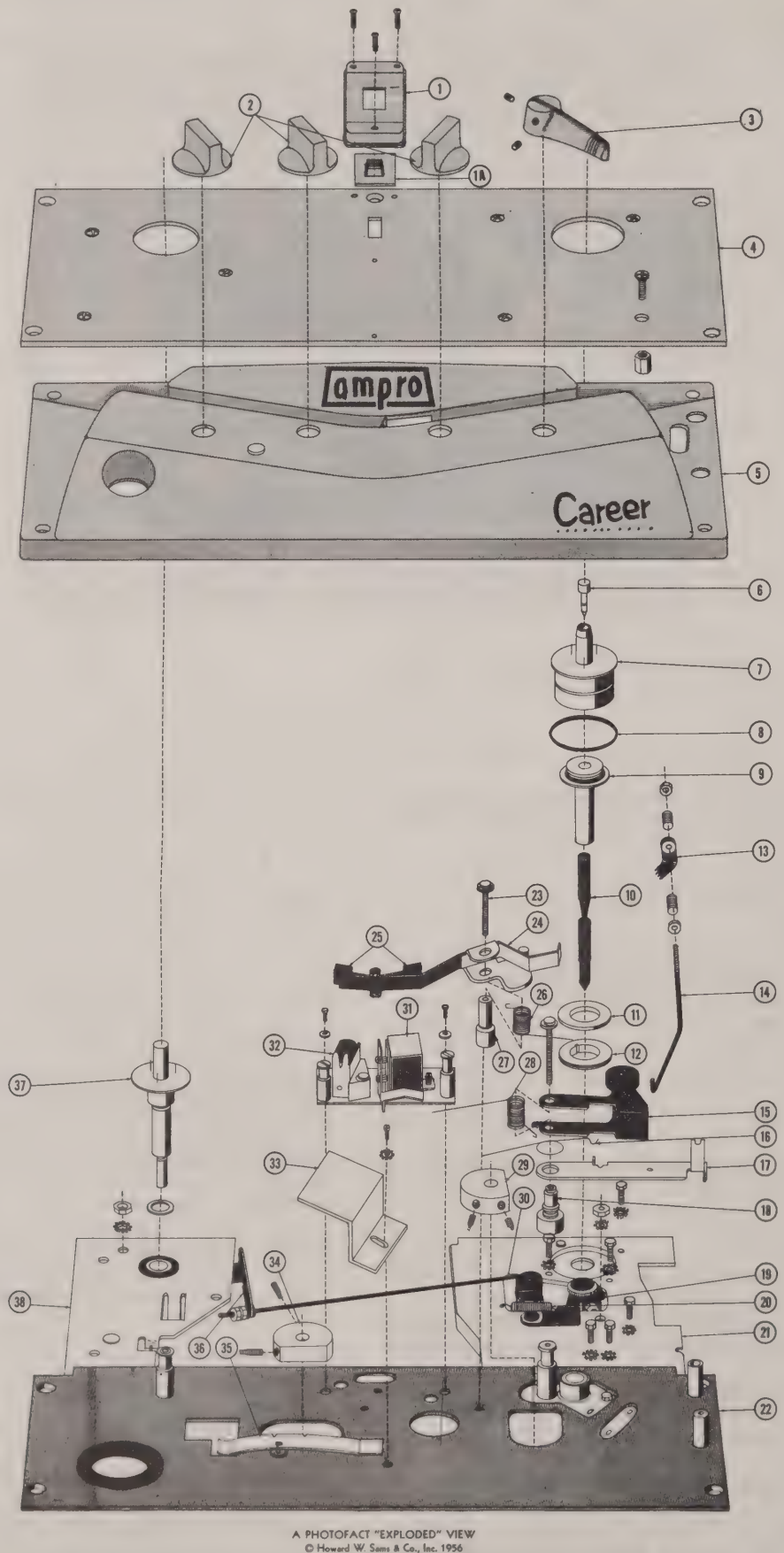


Figure 4A. Exploded View Of Parts Above Baseplate.

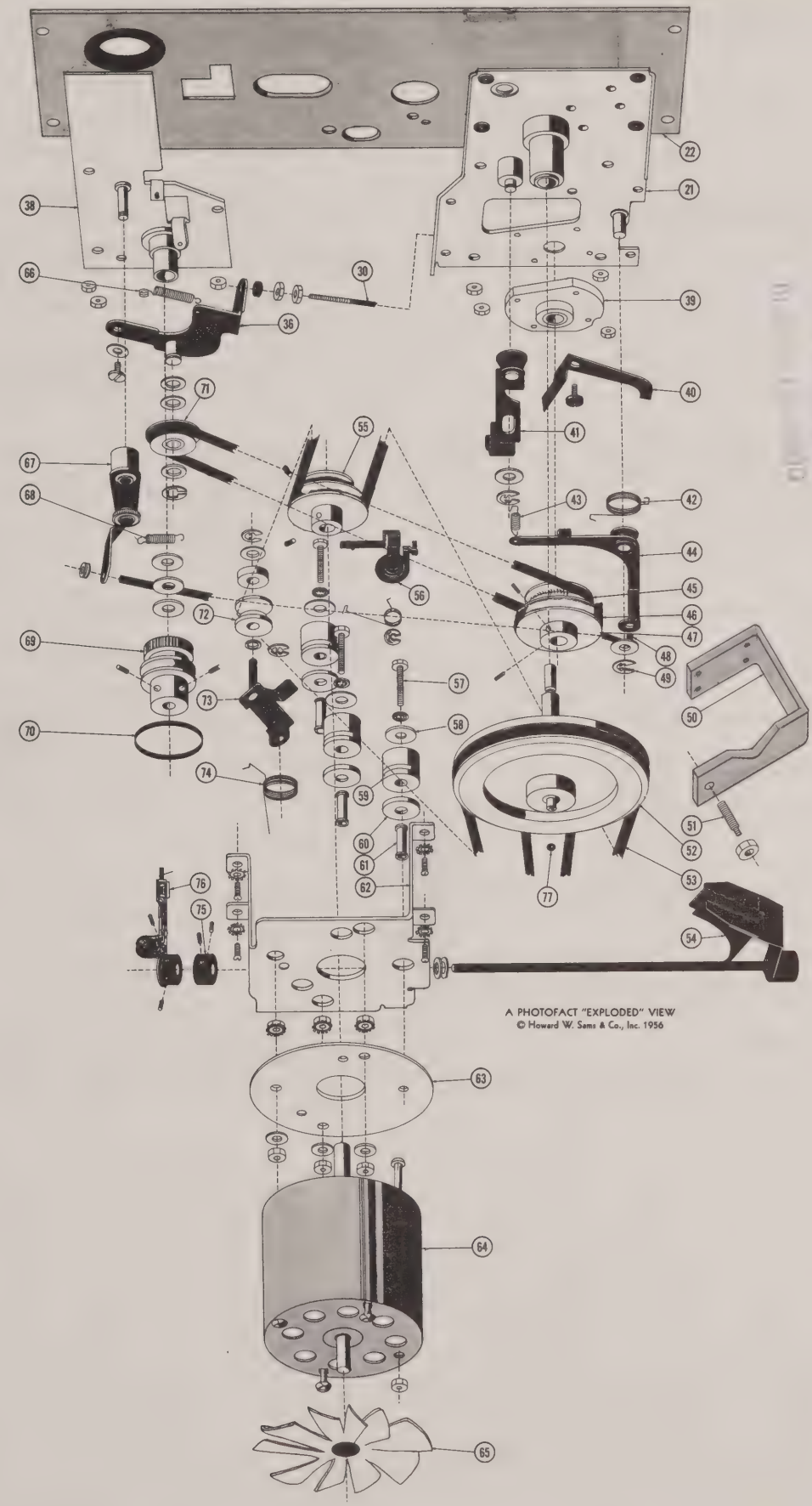


Figure 4B. Exploded View Of Parts Below Baseplate.

Fails To Record-

1. Tape pressure pads (25) not adjusted properly, resulting in the tape not being held against the recording head. See "Rewind - Play Or Record Cam Adjustment".

2. Check the recording tape to see if the dull coated side faces inward on the reel. If the dull side faces outward a recording cannot be made.

Tape Overruns Or Spills When Knob (3) Is Turned To Stop, During Rewind Or Fast Forward-

1. Brake shoes out of adjustment. See Takeup and Feed Reel Brake Adjustments.

2. Rods (30 and 48) loose are not adjusted properly.

Speed Variation Or Wow-

1. Check the capstan (52), pinch roller (15), motor pulley (55), and flywheel (52) for oil or foreign material on their driving surfaces. Clean these parts with a good cleaning fluid.

2. Check motor pulley (55) to see if it is secured to motor shaft.

3. Flat spot on rubber roller (15) not smooth and even, replace part.

4. Pressure Pad assembly (24) applying too much pressure against tape. Check adjustment under "Rewind-Play Or Record Cam (29) Adjustment."

Incorrect Indexing Of Function Knob (2)-

1. The control knob (2) is in Play position the safety interlock button (5A) prevents the shaft from turning.

2. If the operator forces the knob, thereafter, it will not index correctly.

3. Pull of the knob and drive down a wedge, thereby expanding the shaft, then place the knob in the proper position and push down onto the shaft.

No Drive In Fast Forward-

1. Belt (46) loose or broken, thereby when button (6) is depressed fast forward is in-operative.

2. When button is depressed the felt clutch (11) does not make contact, adjust takeup as described under "Takeup Adjustment".

No Rewind-

1. Rewind belt (45) broken or loose.

2. Push rod (30) not properly adjusted, check adjustment under "Rewind Adjustment".

3. No Rewind can be caused by excessive takeup tension. See "Takeup Adjustment".

Speed Change Knob Fails To Change Speed-

1. Setscrews in speed change lever (76) loose causing lever to move on shaft.

2. Belt shifter (54) not adjusted properly. Check to see that shifter moves belt (53) up and down on pulley (55).

Erase Current Too Low-

1. Some 6AQ5 tubes did not deliver full output as oscillators. The cathode resistor was changed from 1500 ohms to 1200 ohms in order to insure satisfactory output from all tubes.

MAINTENANCE

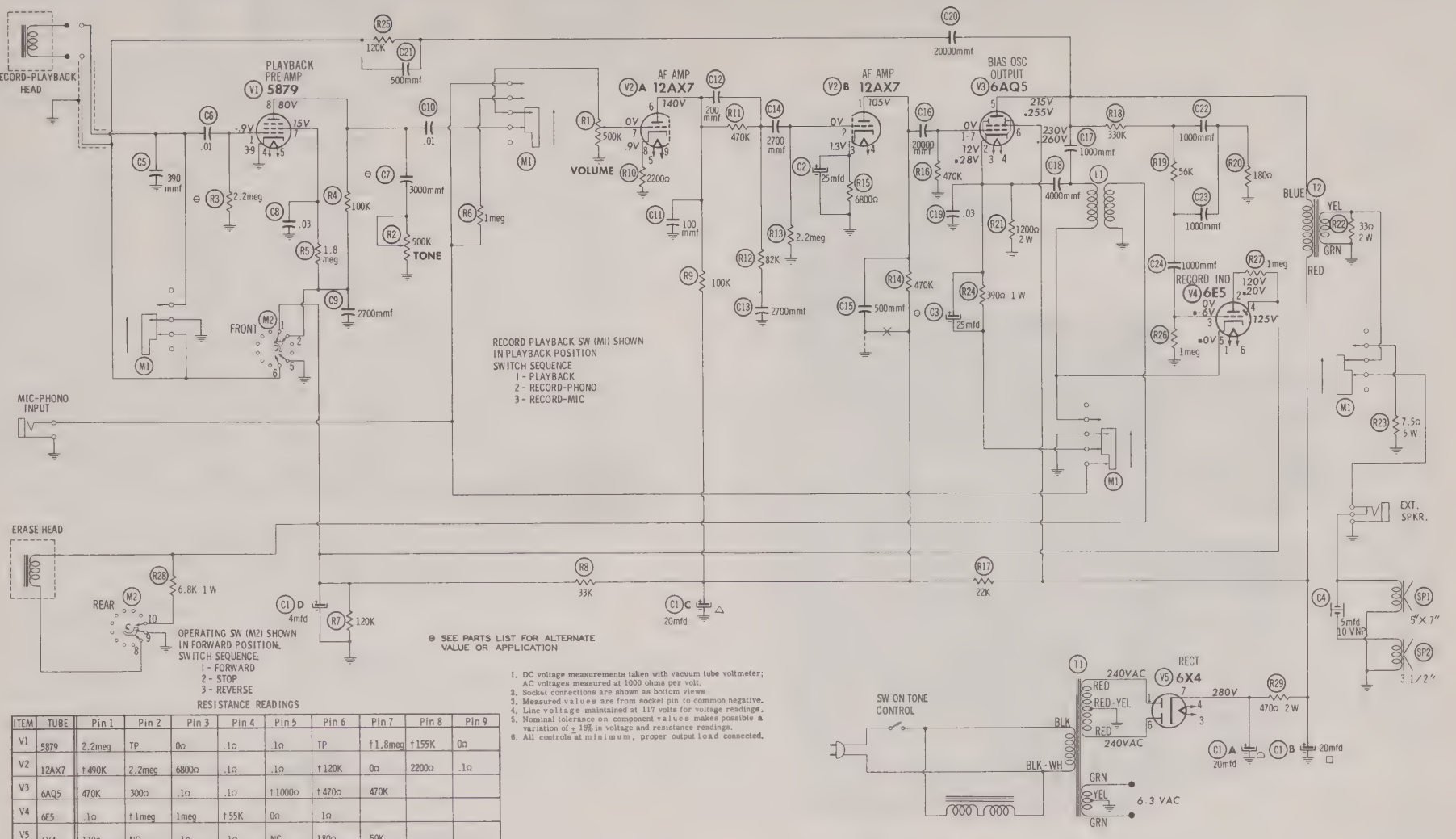
Cleaning The Play-Record Head-

The play-record head is subject to an accumulation of tape coating residue which is worn off the tape as it passes the head. This should be periodically removed since it may cause faint recordings and poor playback. Wipe off the record head contact surfaces carefully with a clean cloth. If dirt is caked or hard and will not come off with a dry cloth, dampen the cloth slightly with water.

NOTE: Do not use a brush or excessive amount of water on the head surface.

LUBRICATION

All rotating parts are provided with generous size oilite bearings, which are factory lubricated and require no further attention. An occasional cleaning out of foreign matter under the plastic cover (5) is desirable.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	2.2meg	TP	0Ω	.1Ω	.1Ω	TP	†1.8meg	†155K	0Ω
V2	12AX7	†490K	2.2meg	6800Ω	.1Ω	.1Ω	†120K	0Ω	2200Ω	.1Ω
V3	6AQ5	470K	300Ω	.1Ω	.1Ω	†1000Ω	†470Ω	470K		
V4	6E5	.1Ω	†1meg	1meg	†55K	0Ω	1Ω			
V5	6X4	170Ω	NC	.1Ω	.1Ω	NC	180Ω	50K		

ALL MEASUREMENTS TAKEN IN PLAY POSITION UNLESS OTHERWISE DESIGNATED WITH MOTOR DISCONNECTED.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.
▪ MEASURED IN RECORD POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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AMPRO
MODEL 745 "Career"

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Playback – Preamplifier	5879	
V2	AF Amplifier	12AX7	
V3	Bias Osc. -Audio Output	6AQ5	

ITEM No.	USE	TYPE	NOTES
V4	Record Ind	6E5	
V5	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AMPRO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	350	181141						
B	■20	350							
C	▲20	350							
D	4	350							
C2	25	15	18486	PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C3	25	15	18486	PRS25V25	BR252	TC26	TD-25-25	FM-0225	TVA-1205
C4	5	10VNP	181205	PRS10VNP8	BBR10-25	TC22 †		MMT-0210 †	Note #1.
					BBR10-25	TC22		MMT-0210	

Note #1. Non-Polarized Unit.
† Connect Negative Leads Together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AMPRO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	390	500	181204			5R5T39			MS-339	
C6	.01	400	17782	BPD-01	D6-103	CUB4S1	GP-10000	PT411	4TM-S1	
C7	3000			DI-003	DD-302	K076	ED-003	UC-523	5GA-D3	Note #1
C8	.03	400	18732	BPD-03	DF-303	CUB6S3		PT413	4TM-S3	
C9	2700		181185	DI-0027	D6-272	K075	ED-0027	UC-5227	5GA-D27	
C10	.01	400	17782	BPD-01	D6-103	CUB4S1	GP-10000	PT-411	4TM-S1	
C11	100		18493	SI100	D6-101	TP34	GP-100	UC-531	5GA-T1	
C12	200		17126	SI200	D6-201	TP38	GP-200	UC-532	5GA-T2	
C13	2700		18733	SI2700	D6-272	TP59	GP-2700	UC-5227	5GA-D27	
C14	2700		181185	DI-0027	D6-272	K075	ED-0027	UC-5227	5GA-D27	
C15	500		18158	SI500	D6-501	TP47	GP-500	UC-535	5GA-T5	
C16	20000		17107	BPD-02	DD-203	K085	ED-02	PT412	5HK-S2	
C17	1000		181202	1464-001		1R5D1	ED-1000	MCB255	MS-21	
C18	4000	500	181148	1464-004		1R5D4		MCB463	MS-24	
C19	.03	150	18586	BPD-03	DF-303	CUB6S3		PT413	4TM-S3	
C20	20000		17107	BPD-02	DD-203	K085	ED-02	PT412	5HK-S2	
C21	500		18158	SI500	D6-501	TP47	GP-500	UC-535	5GA-T5	
C22	1000		181202	1464-001		1R5D1	ED-1000	MCB-255	MS-21	
C23	1000		181202	1464-001		1R5D1	ED-1000	MCB-255	MS-21	
C24	1000		181202	1464-001		1R5D1	ED-1000	MCB-255	MS-21	

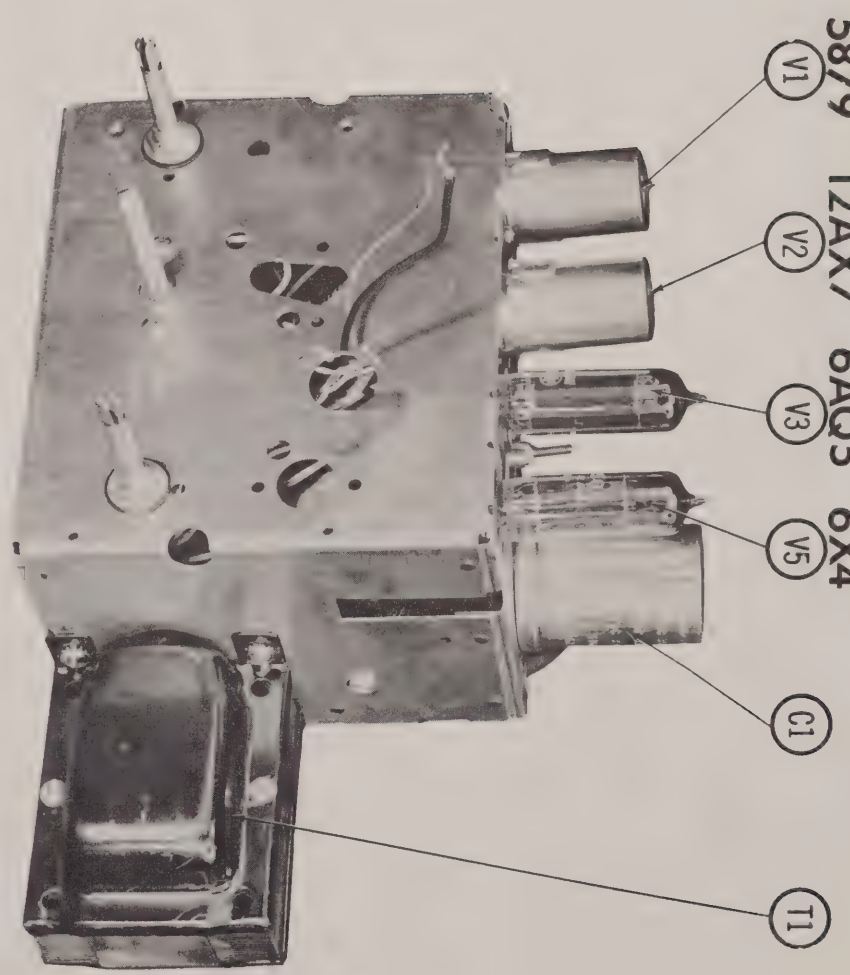
Note #1. Some Versions May Use 1000MMF. In This Application (Part No. 181142)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AMPRO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	♦181176	AB-60	A47-500K-Z	Q13-133	U48	Volume
B				AK-4	KSS3	Not Req.		Shaft (Attach to R1A)
C				KB-1	SWE-12	76-1	US26	Switch (Attach to R1A)
R2A	500K	½	181143	AB-59	A47-500K-S	Q11-133	U50	Tone
B				AK4	KSS3	Not Req.		Shaft (Attach to R2A)

♦Mfg. Parts List 18709.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AMPRO PART No.	IRC PART No.	
R3	2.2meg		18465	BTS-2.2meg	
R4	100K		18471	BTS-100K	Note #1
R5	1.8meg		18436	BTS-1.8meg	
R6	1meg		17558	BTS-1meg	
R7	120K		18816	BTS-120K	
R8	33K		18692	BTS-33K	
R9	100K		18471	BTS-100K	
R10	2200Ω		18472	BTS-2200	
R11	470K		18474	BTS-470K	
R12	82K		181150	BTS-82K	
R13	2.2meg		18465	BTS-2.2meg	
R14	470K		18474	BTS-470K	
R15	6800Ω		181135	BTS-6800	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AMPRO PART No.	IRC PART No.	
R16	470K		18474	BTS-470K	
R17	22K		18583	BTS-22K	
R18	330K		181152	BTS-330K	
R19	56K		17965	BTS-56K	
R20	180Ω		18427	BTS-180	
R21	1200Ω 5%	2	181333	BTA-1200	
R22	33Ω	2	18771	BTA-33	
R23	7.5Ω	5	181132	PW10-7.5	
R24	390Ω	1	181133	BTA-390	
R25	120K		18816	BTS-120	
R26	1meg		17558	BTS-1meg	
R27	1meg		17558	BTS-1meg	
R28	6.8K	1	181215	BTA-6.8K	
R29	470Ω	2	181124	BTB-470	

Note #1. 470KΩ @ 1/2 W Resistor (Part #18474) Used In Some Versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	AMPRO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .29A	465VCT @ .030A	6.3VCT @ 1.8A		181155	P9200 ①	P-3149 ①	PC-8418 ①	24R00U ①	R-6A ①

① Tape 5V, 2A Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AMPRO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8KΩ	3-4Ω	181156	Z1002	A-2901	A-3849	24S61	S-9Z	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AMPRO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Osc. Coil	1.8Ω	2.3Ω	181144				

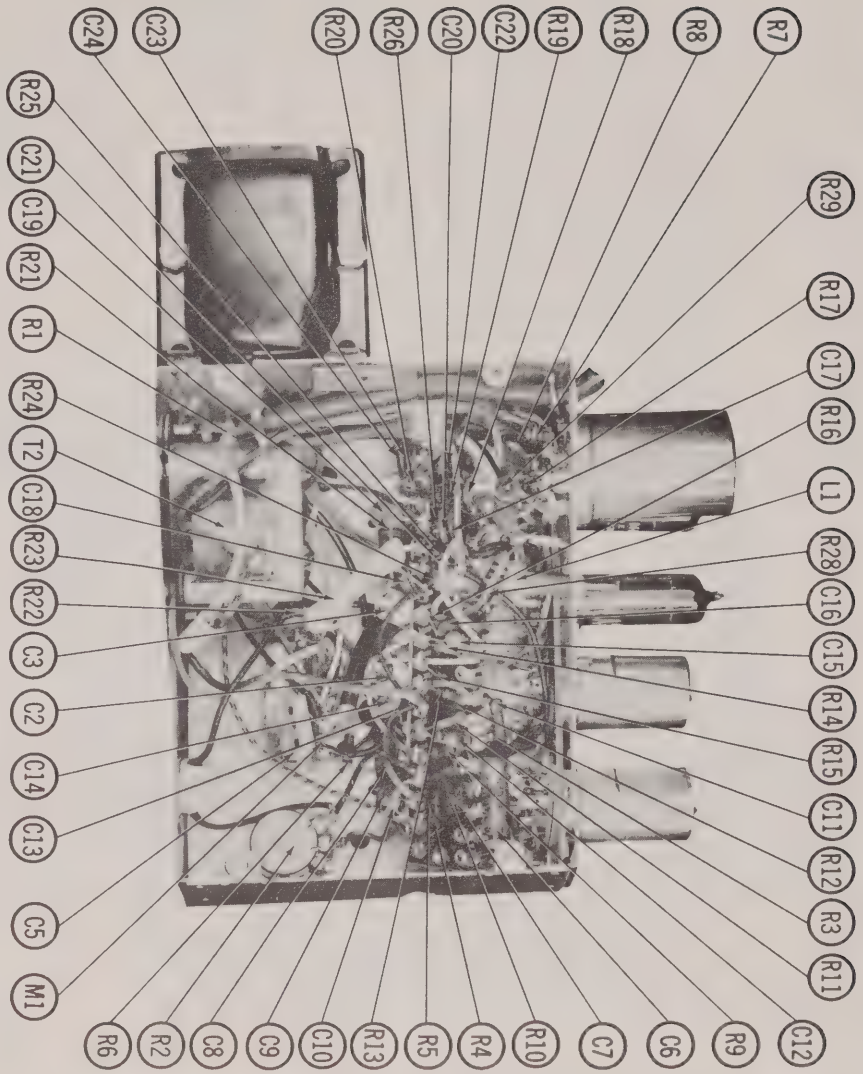
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AMPRO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5X7	PM	3-4Ω	18775	57A21	233S1	
SP2	3 1/2"	PM	3-4Ω	181198	3A15TZ3.3		

MISCELLANEOUS

ITEM No.	PART NAME	AMPRO PART No.	NOTES
M1	Switch	181145	Record-Playback (Slide Type)
M2	Switch	181146	Operating (Rotary, Wafer Type).

CHASSIS—BOTTOM VIEW



MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1		Speed Change Cover	39		Capstan Bearing & Housing
1A	75636-2	Speed Change Knob	40		Instant Stop
2	74612	Control Knob	41		Bell Crank & Link
3	74631	Record - Play - Stop-Rewind	42		Spring
4		Rear Plate	43		Spring
5	74614-1	Front Escutcheon	44		Rewind Brake Actuating Lever
5A		Safety Button	45		Rewind Drive Belt
6	74206	Fast Forward Button	46		Forward Drive Belt
7		Take-Up Spindle	47		Intermediate Reel Drive Pulley
8		"O" Ring	48		Rewind Brake Push Rod
9		Take-Up Drive Hub Drum	49		"C" Retainer
10		Fast Forward Actuating Shaft	50		Flywheel Support Bracket
11		Felt Clutch	51		Vertical Position Screw
12		Adjusting Disc	52		Flywheel & Capstan
13		Pivot Arm	53		Drive Belt
14		Pull Rod	54		Belt Shifter
15		Pinch Roller Assy.	55		Motor Pulley
16		Instant Stop Arm Spring	56		Brake Release Arm
17		Instant Stop Arm	57		Screw
18		Instant Stop Arm Pivot	58		Washer
19		Take-Up Brake Arm	59		Motor Mounting Shocks
20		Take-Up Brake Arm Spring	60		Rubber Washer
21		Take-Up Mounting Plate	61		Spacer
22		Baseplate	62		Motor Mounting Bracket
23		Screw	63		Motor Mounting Plate
24		Pad Actuating Arm	64		Motor
25	16903	Head Pressure Pads	65		Fan
26		Pad Actuating Arm Spring	66		Spring
27		Pad Actuating Arm Pivot	67		Supply Spindle Brake
28		Pinch Roller Spring	68		Brake Spring
29		Play-Record Cam	69		Rewind Brake Drum
30		Push Rod	70		"O" Ring
31	74619	Recording Head	71		Rewind Pulley
32	74618	Erase Head	72		Idler Pulley
33		Escutcheon Support	73		Idler Arm
34		Erase Interlock Cam	74		Idler Spring
35		Interlock Spring	75		Speed Shifter Stop
36		Rewind Driver Arm	76		Speed Change Lever
37		Rewind Spindle	77	16403	Steel Ball Capstan Support
38		Rewind Mounting Plate			

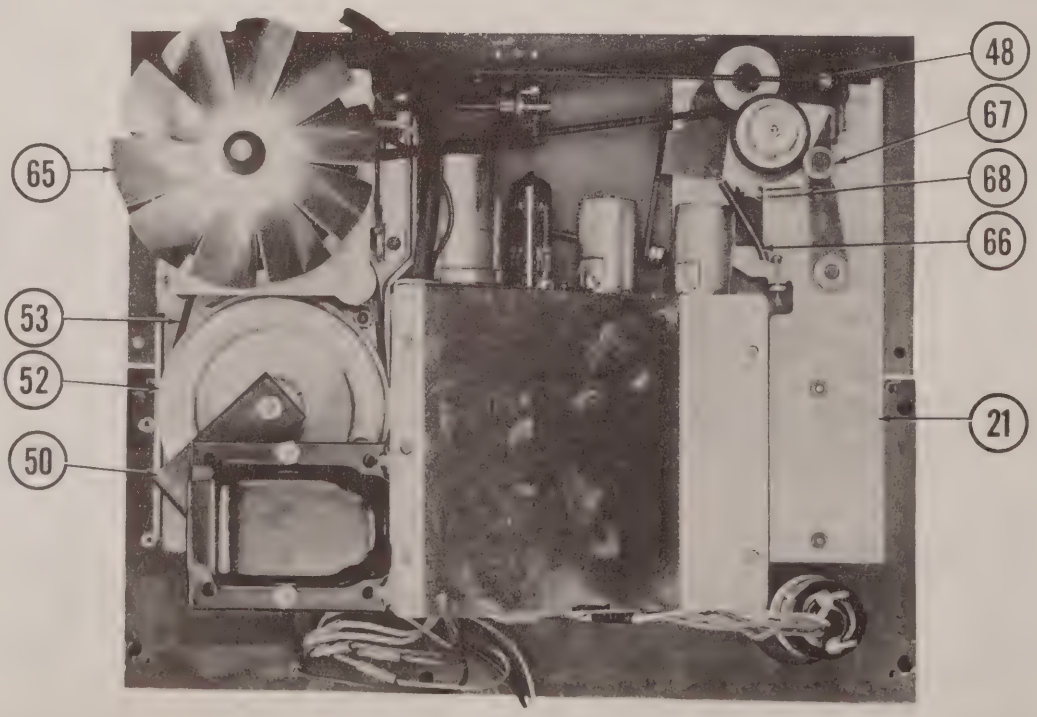


Figure 5

PHOTOFACT* Folder

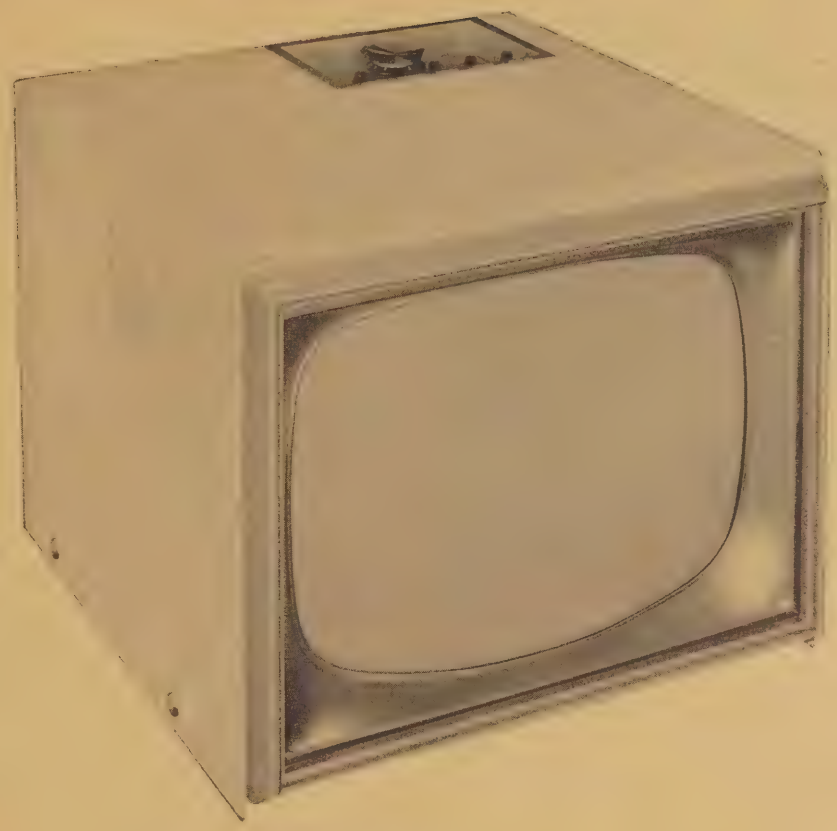
*TRADE MARK

CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . unless it has been purchased as part of a complete volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



CBS-COLUMBIA MODEL 6T104

TRADE NAME	CBS-Columbia Models 6T101, 6T103, 6T104 (Ch. 2017)
MANUFACTURER	CBS-Columbia, A Div. of Columbia Broadcasting System, Inc. , 48-50 34th. St., Long Island City, N.Y.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.38 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC , Sound IF 41.25MC (Intercarrier)

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CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

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CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 7 push-on type control knobs from top panel of cabinet.
2. Remove 5 wood screws. Remove rear cover.
3. Remove 4 phillips head screws (2 from each side) from cabinet.
4. Disconnect speaker leads.
5. Remove 1 wood screw holding rear control panel to cabinet.
6. Remove 3 metal screws from bottom front of mounting board.
7. Lift cabinet from mounting board.
8. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
6T101, 6T103, 6T104	2017

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws at the bottom front of the cabinet holding safety glass bezel. Remove bezel and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizonal oscillator circuit requires the removal of the rear cover and power to be supplied to the chassis. Set the horizontal hold control at the mid-range position and adjust the horizontal frequency slug (L17) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the AM rejection control (R6) for maximum volume and minimum buzz.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

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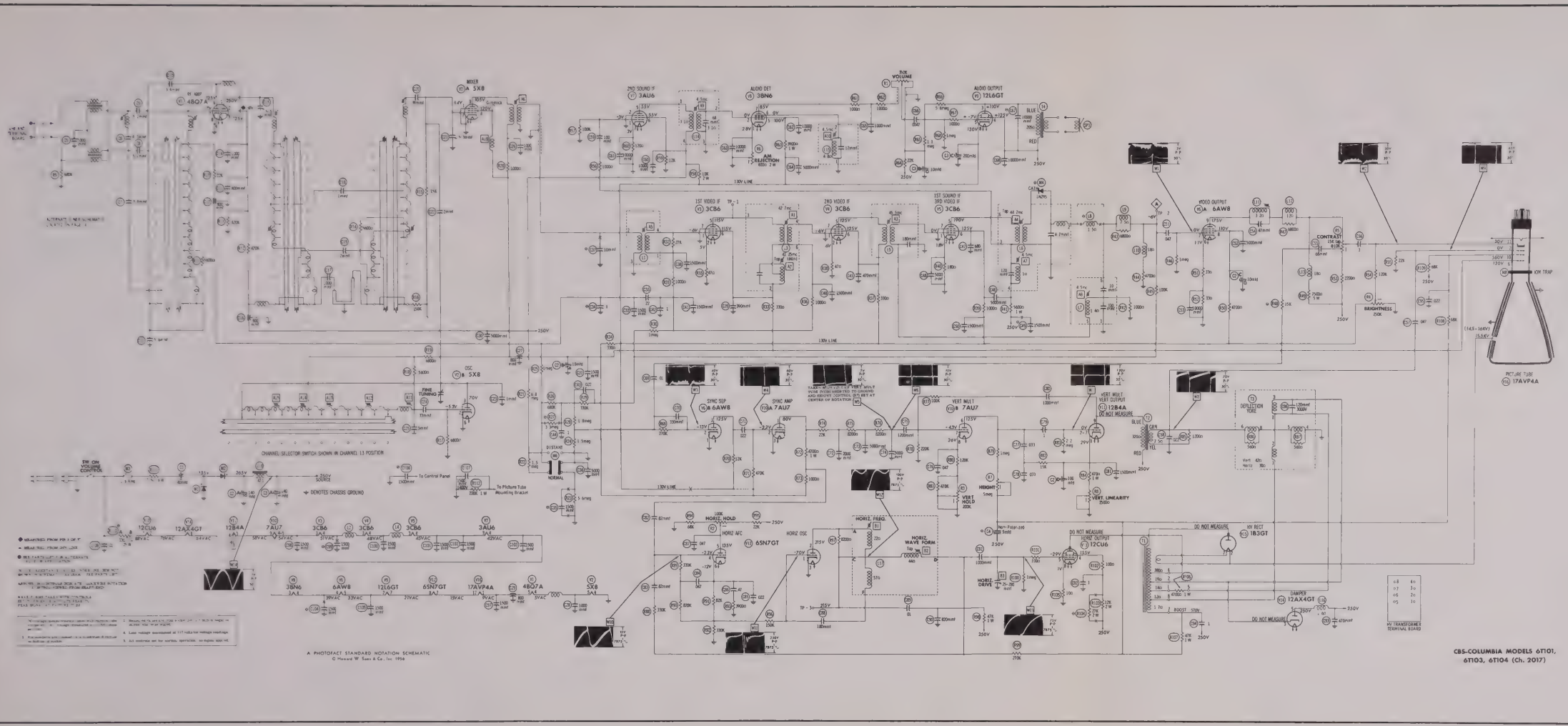
CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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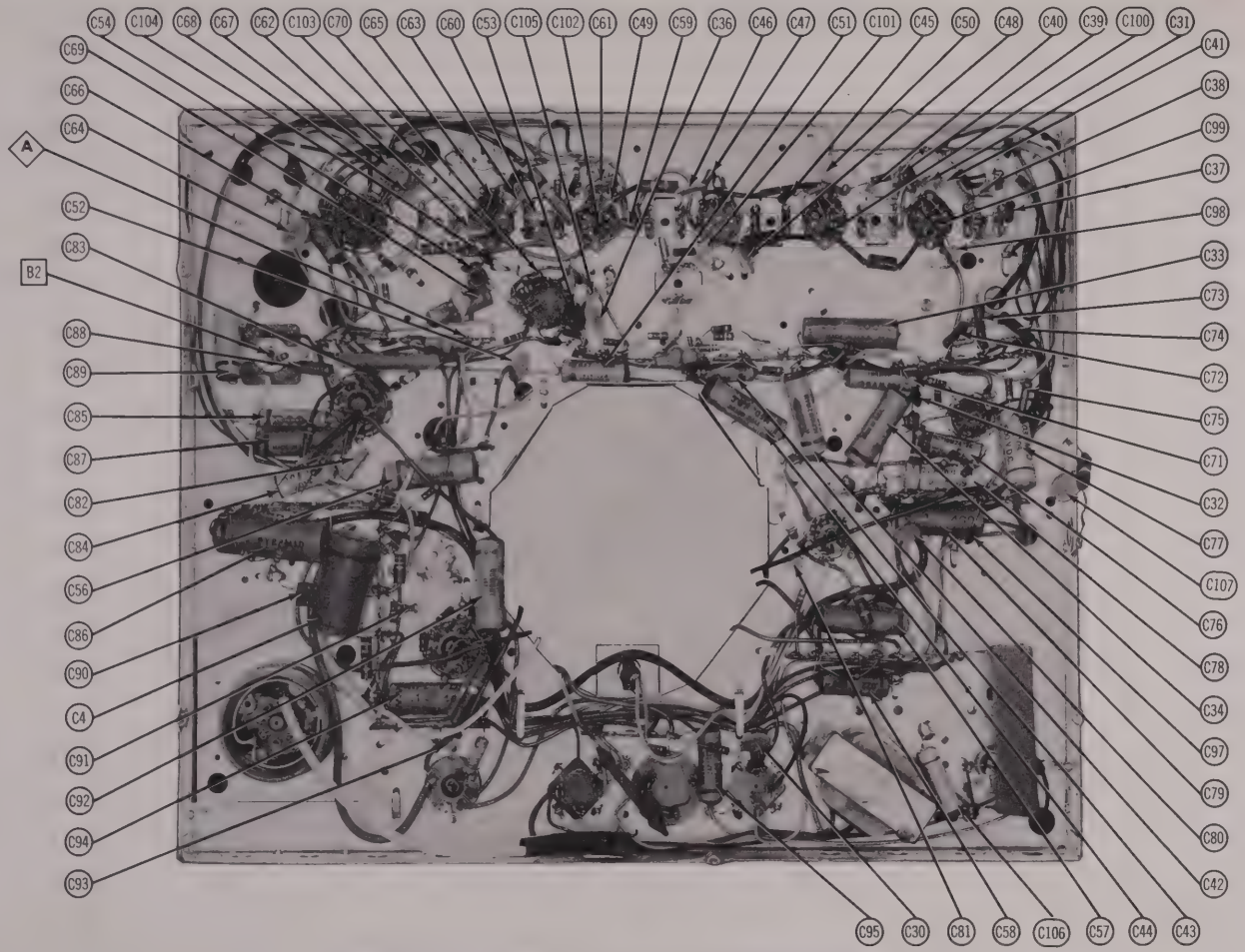
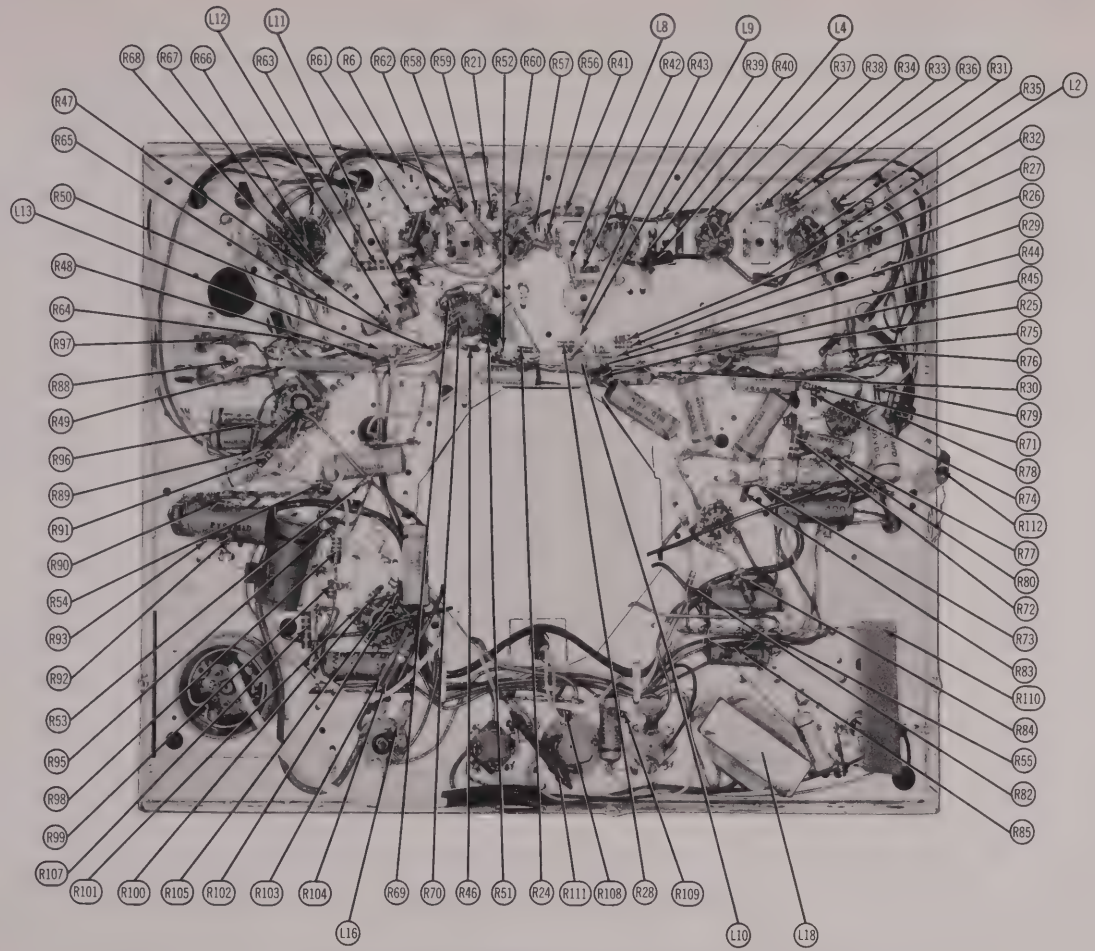
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
MIXER 6X8
OSC 5X8
2ND SOUND IF 3AU6
AUDIO DET 3BN6
AUDIO OUTPUT 12L6GT
1ST VIDEO IF 3CB6
2ND VIDEO IF 3CB6
1ST SOUND IF 3CB6
3RD VIDEO IF 3CB6
VIDEO OUTPUT 6AW8
SYNC SEP 6AW8
SYNC AMP 7AU7
VERT MULT 7AU7
VERT MULT VERT OUTPUT 12B4A
HORIZ AFC 6SN7GT
HORIZ OSC
HORIZ WAVE FORM
HORIZ OUTPUT 12CU6
HV RECT 1B3GT
DAMPER 12AX4GT
PICTURE TUBE 17AVP4A
CONTRAST
BRIGHTNESS
VERT. LINEARITY
HEIGHT
VERT HOLD
HORIZ HOLD
HORIZ FREQ
HORIZ DRIVE
BOOST 570V
DO NOT MEASURE
ION TRAP
DEFLECTION YOKE
HV TRANSFORMER TERMINAL BOARD
CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

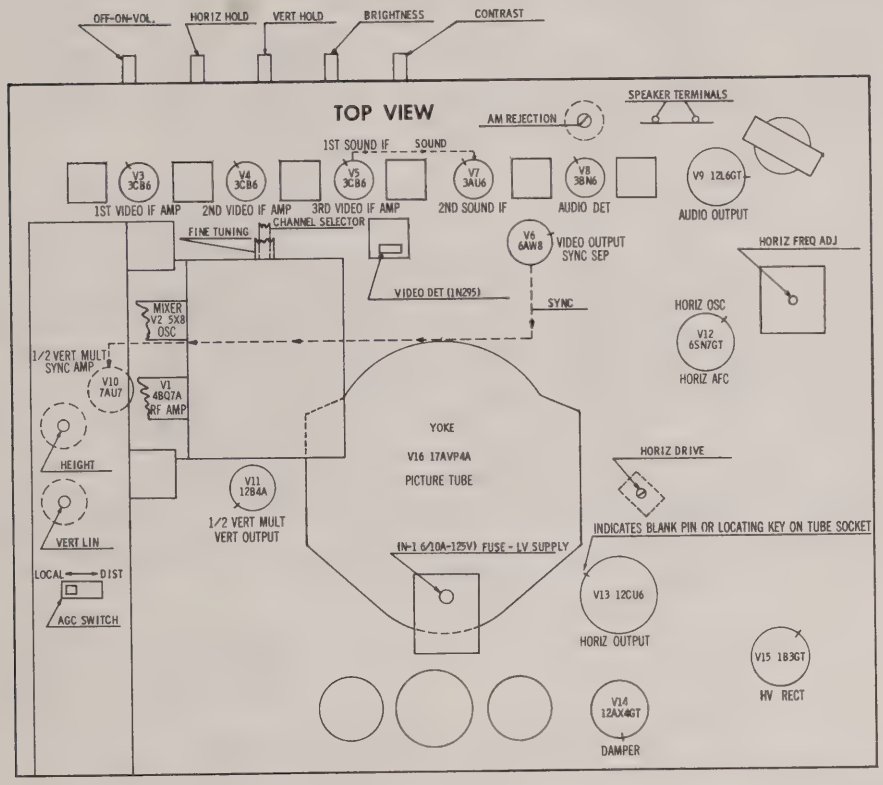


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

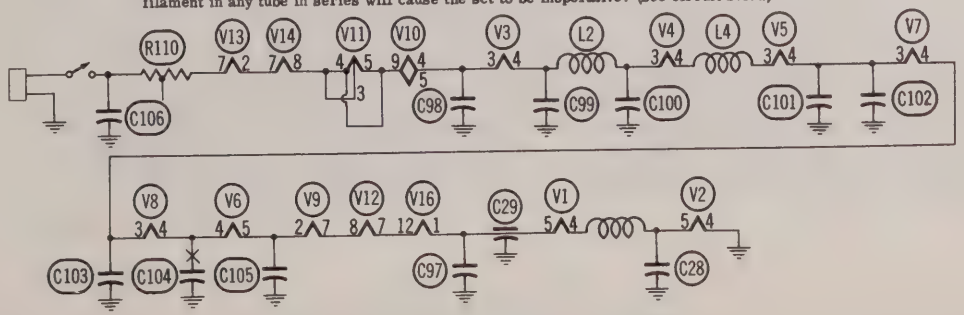
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V16
Has pic, no sound - V5, V7, V8, V9

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12
No vert. or horiz. sync - V6, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1, M2
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See circuit below).



SET 333 FOLDER 4

CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by disconnecting the ground lead from the cathode (Pin 8) of 12CU6 horizontal output tube.

VIDEO IF ALIGNMENT

Set local-distant switch to normal position.
Connect negative lead of 3 volt bias supply to ungrounded side of C33. Positive lead to chassis.
Use lowest possible VTVM range for all steps.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 of V3. Low side to chassis.	42.7MC (Unmod)	Any non-interfering channel	DC probe to point (A). Low side to chassis.	A1	Adjust for maximum deflection.
2.	"	"	41.25MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	45.5MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	44.2MC	"	"	A4	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Attenuate sweep generator output to maintain 3 volts peak to peak vertical deflection on scope. Leave bias connected to ungrounded side of C33.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube. Low side to chassis.	43MC (10MC Swp)	42.45MC 45.75MC	Any non-interfering channel	Vert. Amp. to point (A). Low side to chassis.	A5, A6	Adjust A5 and A6 to place markers in position as in Fig. 1. If necessary retouch A1, A3 and A4 for correct response as in Fig. 1.

SOUND IF ALIGNMENT

Increase bias supply to 6 volts and set local-distant switch to local position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to junction of L11 and L12. Low side to chassis.	4.5MC (400% AM Mod. 30%)	Any non-interfering channel	Across audio output transformer secondary.	A7, A8, A9	Adjust for maximum deflection.
7.	"	"	4.5MC (25KC FM)	"	"	A10	Set volume control to approximate center. Adjust A10 for maximum deflection of meter.
8.	"	"	4.5MC (400% AM 30% Mod)	"	"	R6	Adjust for MINIMUM deflection. Repeat step 7.

ALTERNATE SOUND IF ALIGNMENT USING TV SIGNAL

1. Tune the receiver to a strong TV signal and adjust for best picture. Set "AM Rejection" control at the center of its range. Attenuate signal (remove antenna and/or set local-distant switch to local position) until a hiss is heard in the sound. Adjust A7, A8 and A9 for maximum sound.
2. Increase signal level to normal and adjust A10 for maximum sound and minimum buzz.
3. Attenuate signal again and adjust R6 for MINIMUM hiss and noise.
4. Increase signal level to normal and rotate the fine tuning control. If the buzz is still present, readjust A10 for clearest sound and minimum buzz.

OSCILLATOR FOR TUNER #6900081l

Oscillator adjustment slugs are provided for channels 13, 11, 8, 6 and 4.
Adjustment of any one channel will effect all other channels below it in that band.
Set the channel selector switch to the highest high band (7 thru 13) channel operating in the area. Adjust the fine tuning so that the hole in the fine tuning drive wheel is in line with the access hole for channel 13 adjustment (A11). Adjust A11 for best picture and sound on the channel requiring adjustment. Check all other lower channels in the same band. If a lower channel requires adjustment, adjust the corresponding slug. If a slug is not provided for that channel, adjust the next higher channel slug available. Continue this procedure until all higher channels are adjusted. To adjust the lower band channels (2 thru 6), tune in the highest low band channel requiring adjustment and adjust the slug for that channel.
If a slug is not provided for that channel, adjust the next higher channel slug. Continue this procedure until all low band channels are in adjustment.

RF ALIGNMENT FOR TUNER #6900081l

This portion of the receiver has been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

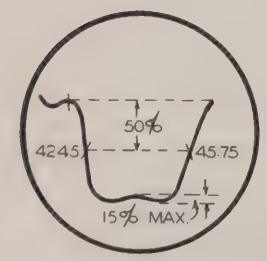
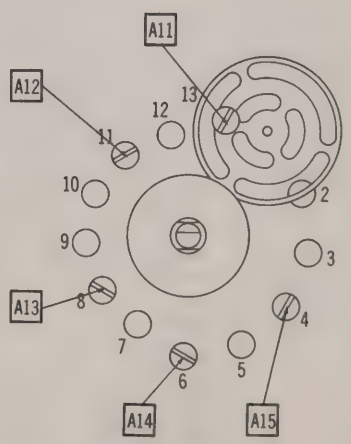


FIG. 1

FIG. 2



OSCILLATOR ADJUSTMENTS

ALIGNMENT INSTRUCTIONS (cont)

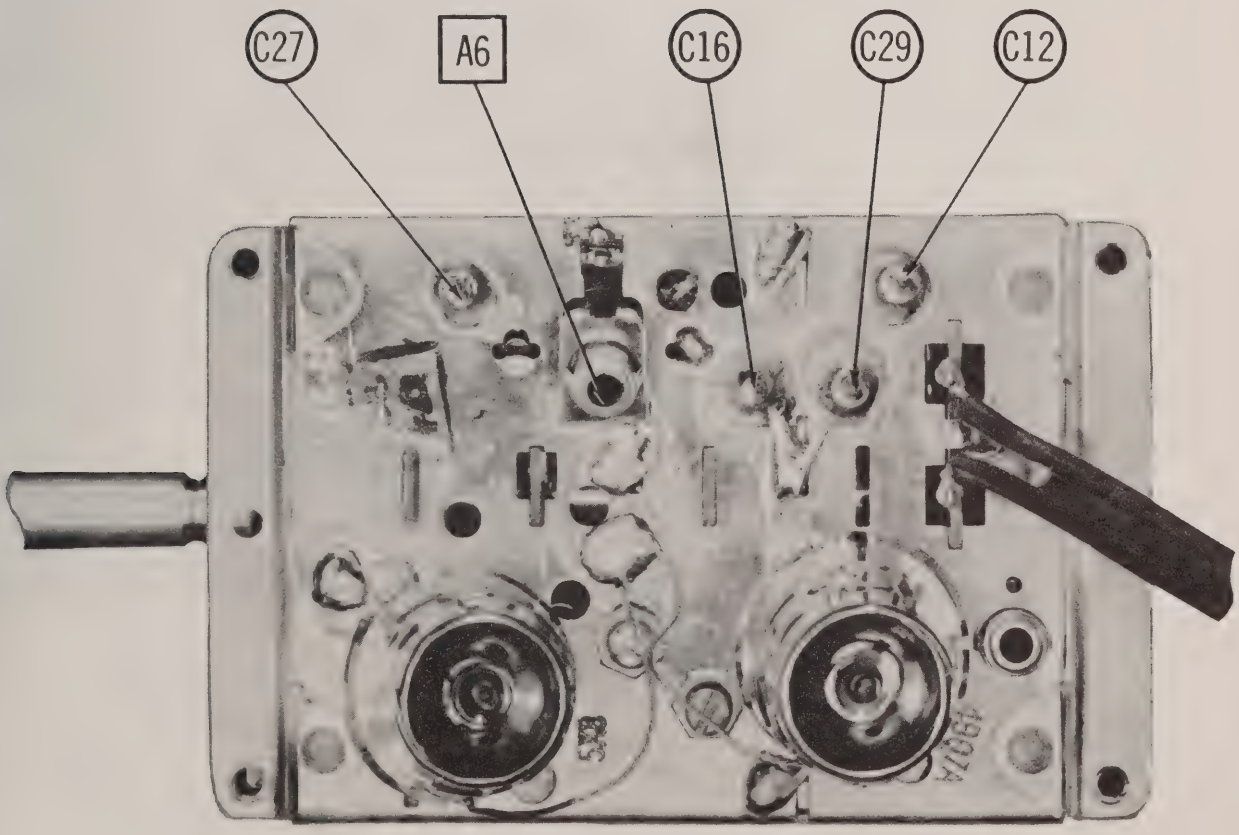
OSCILLATOR ALIGNMENT FOR TUNER #69000801

The oscillator adjustment screws are reached thru a hole in the top of the cabinet under the fine tuning knob. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 2.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

RF AND MIXER ALIGNMENT FOR TUNER #69000801

This portion of the receiver has been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

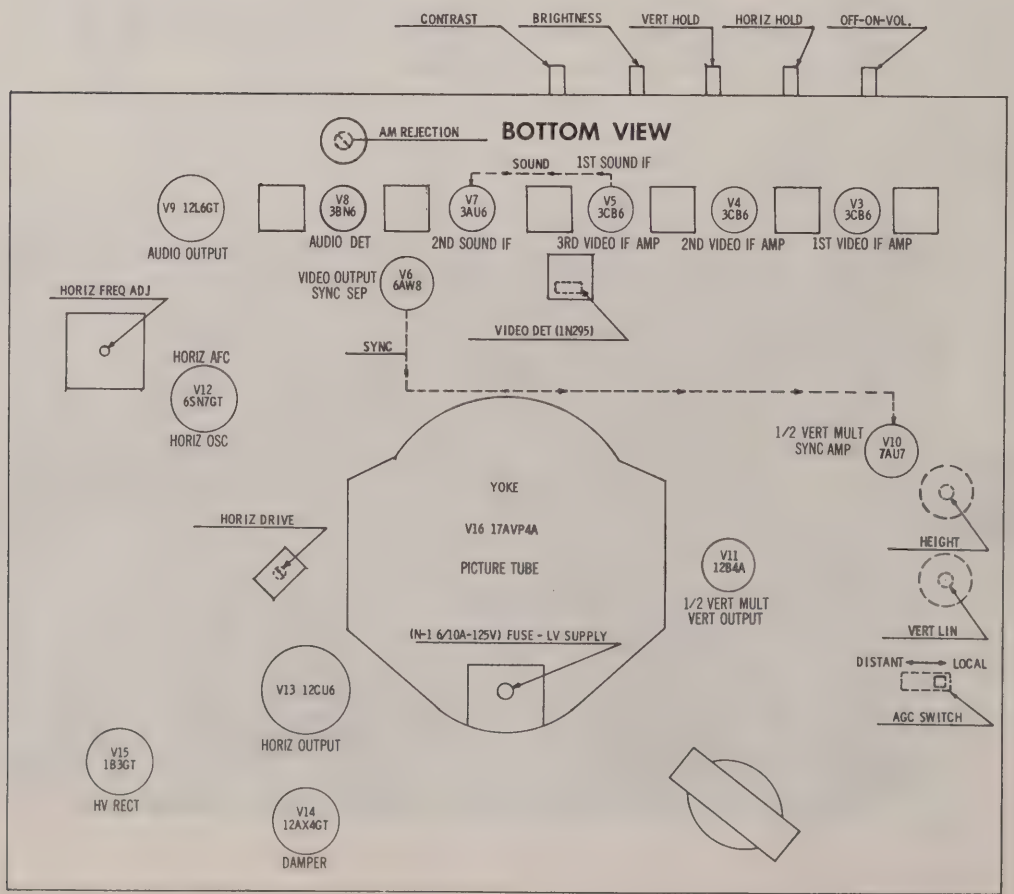


RF TUNER TOP VIEW

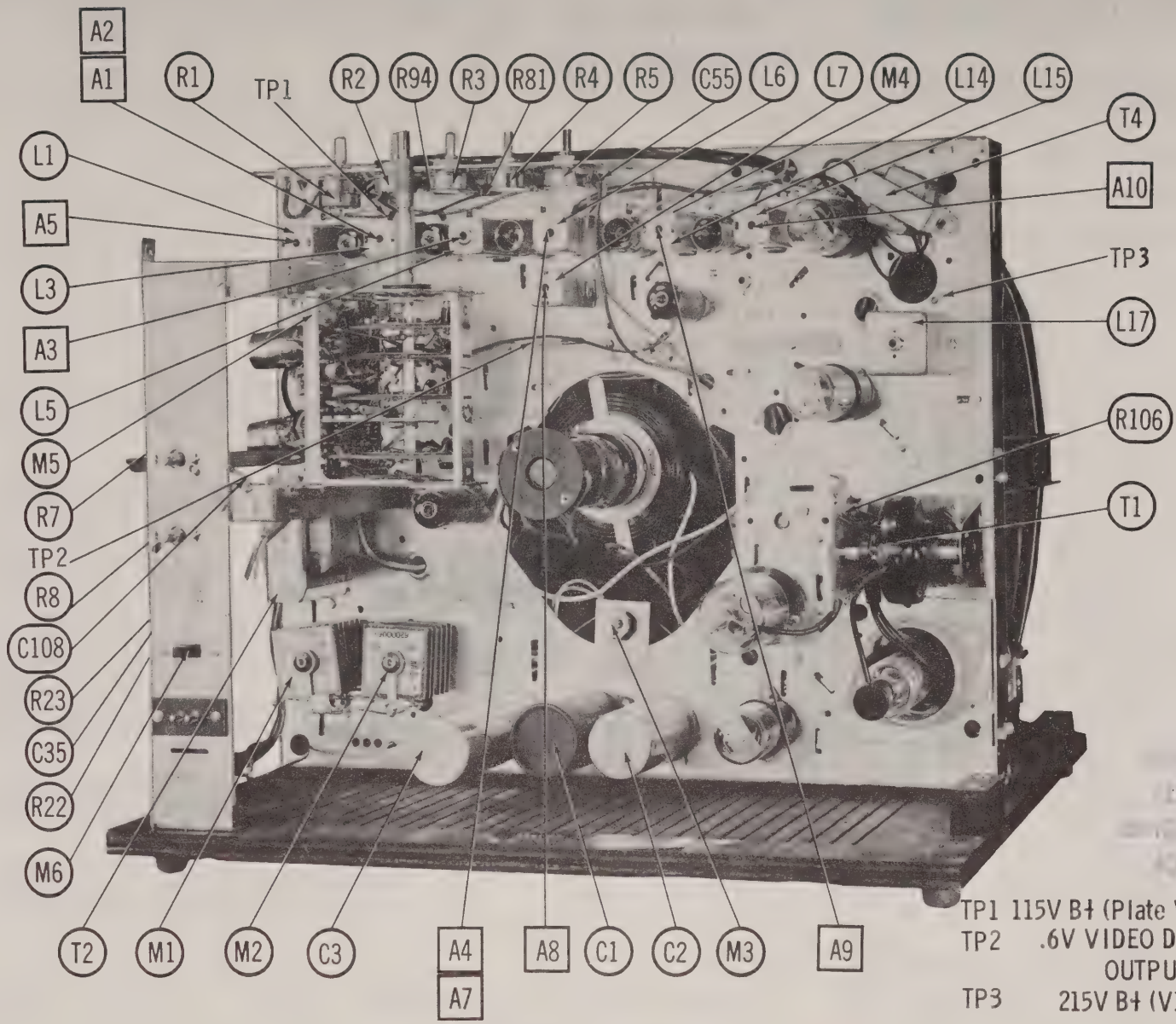
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BQ7A	† 47Ω	220K	INF	1Ω	2Ω	INF	1.7Meg	0Ω	0Ω
V2	5X8	0Ω	6800Ω	■7000Ω	0Ω	1Ω	0Ω	165K	■ 330Ω	■ 1300Ω
V3	3CB6	1Meg	47Ω	14Ω	13Ω	■ 660Ω	■ 660Ω	0Ω		
V4	3CB6	1Meg	47Ω	13Ω	12Ω	■ 330Ω	■ 330Ω	0Ω		
V5	3CB6	1000Ω	180Ω	12Ω	11Ω	† 5600Ω	■ 1000Ω	0Ω		
V6	6AW8	0Ω	1.7Meg	■12K	9Ω	7Ω	66Ω	1Meg	■ 4700Ω	† 5000Ω
V7	3AU6	100K	0Ω	11Ω	10Ω	■ 8500Ω	■ 8500Ω	120Ω		
V8	3BN6	● 330Ω	3.1Ω	10Ω	9Ω	■ 3900Ω	4.8Ω	† 350K		
V9	12L6GT	TP	7Ω	† 250Ω	† 47Ω	450K	TP	5Ω	17K	
V10	7AU7	■ 6000Ω	480K	0Ω	14Ω	14Ω	●▲ 2.5Meg	220K	● 180K	15Ω
V11	12B4A	● 1000Ω	2.2Meg	16Ω	15Ω	15Ω	TP	2.2Meg	NC	† 370Ω
V12	6SN7GT	480K	† 40K	0Ω	1.5Meg	●† 50K	400K	3Ω	5Ω	
V13	12CU6	TP	17Ω	NC	† 8000Ω	1Meg	TP	19Ω	10Ω	TOP CAP ▲ 19Ω
V14	12AX4GT	NC	NC	170K	NC	† 49Ω	NC	17Ω	16Ω	
V15	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲ 400Ω
V16	17AVP4A	2Ω	22K	PIN 6 ■ 330Ω	PIN 10 ▲ 100K	PIN 11 ●■ 160K	PIN 12 3Ω			

† MEASURED FROM OUTPUT OF M2.
■ MEASURED FROM 130V LINE.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 3 OF V14.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART



TP1 115V B+ (Plate V3)
TP2 .6V VIDEO DET. OUTPUT
TP3 215V B+ (V12)

CHASSIS REAR VIEW

CBS-COLUMBIA MODELS 6T101, 6T103, 6T104 (Ch. 2017)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES	ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BQ7A		V8	Audio Detector	3BN6	
V2	Mixer-Oscillator	6J8		V9	Audio Output	12L8GT	
V3	1st Video IF Amplifier	3C9d		V10	Vert. Mult. -Sync Amp.	7AU7	
V4	2nd Video IF Amplifier	3C9d		V11	Vert. Mult. - Vert. Output	U26A	
V5	3rd Video IF Amplifier	3C9d		V12	Horiz. AFC-Horiz. Osc.	6SN7GT	
V6	1st Sound IF Amplifier	3C9d		V13	Horiz. Output	12C5W	
V7	Video Output-Sync Sep.	6AW8		V14	Damper	1AX4GT	
V7	2nd Sound IF Amplifier	3AU6		V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	CBS-Columbia Part No.	CBS Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	
V16	17AVP4-A ①	17AVP4-A ①	17AVP4 ①	17AVP4-A ① ② Aluminized ③ Silver screen " 85"	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA CBS-Columbia Part No.	AEROVOX Part No.	CORNELL DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.	NOTES
C1	140	200	21000981	AFH31-37-25	XA067	FP131	TMH-34	S-160	TVL-1540	
C3A	160	350	21001131	AFH4-97-25	D0064	FP451.3			R3166 *	
B	40	450			BRH501	TC40				
C	10	450								
D	100	50								
C3A	160	350	21001241	AFH3-106-60		FP419.4	TMT-177	Q-162	R3292 *	
B	10	450				TC78		LMT-4540		
C	200	25								
C4	5	350	21000481 (Note 1)	KP-PRS250VS	BR1355		TD-5-350NP	MT-3513 ①	R3293 *	
					BR1335 ①			MT-3512 ①		

Note 1. Non-polarized unit.
† Connect negative leads together.
* Unit must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA CBS-Columbia Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C5	1000		BPD-001	DD-105	X069	501-001	DC-531	5HK-DI	5HK-DI	
C6	4.7		MPG-D24.7	TC2-4R7	Z010	MPGA-4R7	ET-5547	5TCCB-V47		
C7	5.6									
C8	5.1									
C9	5.1									
C10	2.2									
C11	5.6									
C12	500									
C13	500		BPD-0008	DD-501	G087	511-511			5CA-T8	
C14	1000		BPD-001	DD-103	X069	501-001	DC-531	5HK-DI	5HK-DI	
C15	.5-5			532-3		511-001-GR5	DC-5315			
C16	500									
C17	1000		BPD-001	DD-103	X069	501-001	DC-531	5HK-DI	5HK-DI	
C18	1		MPG-E21	TC2-1	T205	MPGA-510			5TCCB-V1	
C19	1		MPG-E23.2	TC2-1R2	T206	MPGA-1R2			5TCCB-V32	
C20	39									
C21	5-5			531-3		3121-01-GR5	CT565A			
C22	1		MPG-E23.2	TC2-1R2	T206	MPGA-1R2			5TCCB-V32	
C23	1		MPG-E21	TC2-1	T205	MPGA-510			5TCCB-V1	
C24	33			TC1-33						
C25	5									
C26	1000		BPD-001	DD-103	X069	501-001	DC-531	5HK-DI		
C27	500									
C28	1000		BPD-001	DD-103	X069	501-001	DC-531	5HK-DI		
C29	500									
C30	5000		13046500	BPD-005	DD-503	X060	511-005	DC-535	5HK-D5	
C31	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C32	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C33	33	350	13013330	P388N-33		CUBAP33			PT4033	
C34	300		13012380	P388N-301	DF-104	CUBAP301			PT4T-P1	Note 3
C35	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	Note 3
C36	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	Note 3
C37	10		13010100	MPG-B1100	TC3-10	Z099	MPGA-100	ZT-541	5TCC-Q1	Note 3
C38	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C39	390		13012390	P388N-391	DF-104	CUBAP391			PT4T-P1	
C40	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C41	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C42	.1	200	13012380	P388N-301	DF-104	CUBAP301			PT4T-P1	
C43	.1	200	13012390	P388N-391	DF-104	CUBAP391			PT4T-P1	
C44	.022	200	13012300	BPD-022	DD-223	CUBAP223	417-02	PT4T-P1	2T4M-P1	
C45	.1	200	13012380	P388N-301	DF-104	CUBAP301			PT4T-P1	
C46	470		13004700	S1470	DE-471	TP65	GP2K-471	UC-5347	5GA-T47	
C47	5600		13046500	BPD-005	DD-503	X060	511-005	DC-535	5HK-D5	
C47	680		13004720	S2680	DE-681	G065	GP2K-681	UC-5388	5GA-T68	
C48	5600		13046500	BPD-005	DD-503	X060	511-005	DC-535	5HK-D5	Note 3
C49	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	Note 3
C50	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C51	.047	300	23007740	BPD-05	DF-503	CUBS847		PT4047	5TM-D47	
C52	5000		13046500	BPD-005	DD-502	X060	511-005	DC-535	5HK-D5	
C53	10000		13013000	BPD-103	DD-502	X060	511-005	DC-535	5HK-D5	
C54	47		30006940	MPG-E147	DD-470	Z033	831-470	ET-5447	5TCC-Q47	
C55	68		13001080	S819	DE-680	TP93	GP2K-680	UC-5343	5GA-Q68	
C56	.1	400	23011790	P468N-1	DF-104	CUB4P1		PT4DL	4TM-P1	
C57	.047	600	23007740	BPD-05	DF-503	CUBS847		PT4047	5TM-647	
C58	.022	600	23012300	BPD-02	DD-223	CUBS822	417-02	PT4T32	5TM-S22	
C59	100		13001520	S1100	DE-101	TP34	GP2K-101	UC-531	5GA-T1	
C60	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	
C61	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	
C62	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	
C63	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	
C64	1000		13046060	BPD-006	DD-502	X060	511-005	DC-535	5HK-D5	
C65	1000		13001740	S1000	DE-102	TP53	GP2L-102	UC-531	5GA-D1	
C66	.0047	400	13001830	BPD-0047	DE-472	CUBAD47	GP3-333-472	PT4347	5TM-D47	
C67	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	Note 3
C68	10000		13046020	BPD-01	DD-103	K082	511-01	DC-511	5HK-81	
C69	1500		13001840	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C70	1000		13001830	BPD-001	DD-103	K069	501-001	DC-531	5HK-DI	
C71	1500		13001840	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C72	1500		13001840	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C73	1500		13001840	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C74	1500		13001840	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C75	1000		13001830	BPD-001	DD-103	K069	501-001	DC-531	5HK-DI	
C76	.01	600	23017660	BPD-01	DD-103	CUB681	GP3-333-103	PT4T61	5TM-61	
C77	1500	1400	23007030	BPD-15-1500	D330-152	Y1D15	1R5KV-152	DC30915	MB-D15	
C78	1500		23007010	BPD-15-1500	D330-152	Y1D15	1R5KV-152	DC30215	MB-D15	Note 3

Note 2. Some versions may use .022MFD unit (part #3201760) in this application.
Note 3. Not used in some versions.

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA CBS-Columbia Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C78	.047	200	23007740	BPD-05	DF-503	CUBS847		PT4047	5TM-D47	
C77	.033	600	23015230							
C78	.033	600	23015230							
C79	.1	600	23008380	P488N-1	DF-104	CUB4P1		PT4DL	4TM-81	
C80	1000		13046470	BPD-001	DD-103	G069	511-105	UC-531	5GA-D1	
C81	1500		13046440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C82	33	600	23008810	1469-000683	D6-820	3SR5Q82	831-820	MS-482		
C83	33	500	23008810	1469-000683	D6-820	3SR5Q82	831-820	MS-482		
C84	.047	300	23014340	P388N-047		CUBS847		PT4347	2TM-847	
C85	.047	300	23012100	P388N-047		CUBS847		PT4347	5TM-822	
C86	.47	300	23007840	P388N-47		CUBS847		PT4047	5TM-D47	
C87	.047	600	23012340	P668N-047		CUBS847		PT4047	5TM-D47	
C88	150	500	23007090	1469-00018	D6-181	3SR5738	831-181	MS-382		
C89	.01	600	23000091			UR5T82	811-821	MS-382		
C90	180	500	23007170	1464-00062						
C91	1000		23007740	S1000	D6-102	TP53	GP2L-102	UC-531	5GA-D1	
C92	1	400	23011780	P488N-1	DF-104	CUB4P1		PT4DL	4TM-P1	
C93	470		23001200	S2470	DE-471	TP65	GP2K-471	UC-5347	5GA-T47	
C94	.1	400	23008380	P488N-1	DF-104	CUB4P1		PT4DL	4TM-P1	
C95	.022	600	23015300	BPD-02	DD-223	CUBS822		PT4T32	5TM-S22	
C96	130	2000				DD80-121			30GA-T13	
C97	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C98	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C99	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	Note 3
C100	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C101	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C102	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C103	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C104	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	Note 3
C105	1500		23066440	BPD-0015	DD-153	K071	501-0015	DC-5315	5HK-DI5	
C106	.01	600	23017660	BPD-01	DD-103	CUB681	GP3-333-103	PT4T61	5TM-61	
C107	1500	1400	23007030	BPD-15-1500	D330-152	Y1D15	1R5KV-152	DC30915	MB-D15	
C108	1500		23007010	BPD-15-1500	D330-152	Y1D15	1R5KV-152	DC30215	MB-D15	Note 3

Note 3. Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST ANCE	WATTS	REPLACEMENT DATA CBS-Columbia Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	350K		35001631	B-50-S	A47-500K-Z	Q13-132	1M6	Volume
B	Shaft		Not Req.	Not Req.	FB-3	Not Req.	Not Req.	Attach to R1A
R2A	100K		35001631	B-40	A47-100K-S	Q11-131	1M1	Hold, Hold
B	Shaft		Not Req.	Not Req.	FB-3	Not Req.	Not Req.	Attach to R2A
R3A	200K		35001631	B-46	A47-200K-S	Q11-132	1M3	Vert. Hold
B	Shaft		Not Req.	Not Req.	FB-3	Not Req.	Not Req.	Attach to R3A
R4A	250K		35001631	B-50	A47-250K-S	Q11-132	1M6	Brightness
B	Shaft		Not Req.	Not Req.	FB-3	Not Req.	Not Req.	Attach to R4A
R5A	15K		35001633	AB-154			UT-153	Contrast - taped ⑤10K
B	Shaft		Not Req.	AK-3			Not Req.	Attach to R5A
R6	600Ω	2	35001311		39-600			AM Rejection wire-wound
R7A	5Meg		35001827	AB-57	A47-5Meg-S	Q11-141	TA56L	Height
B	Shaft		Not Req.	AK-4	KSE-3	Not Req.	Not Req.	Attach to R7A
R8A	250Ω		35001835	AB-7	A47-250Ω-S	Q11-112	TA52L	Vert. Linearity
B	Shaft		Not Req.	AK-4	KSE-3	Not Req.	Not Req.	Attach to R8A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA CBS-Columbia Part No.	IRC Part No.	NOTES
R9	680KΩ		BTS-680K	BTS-680K	
R10	22K		BTS-22K	BTS-100K	
R11	5600Ω		BTS-5600	BTS-10K	
R12	4700		BTS-4700	BTS-12K	
R13	820K		BTS-820K	BTS-120	
R14	5600Ω		BTS-5600	BTS-1000	
R15	15K		BTS-15K	BTS-1000	
R16	150K		BTS-150K	BTS-100K	
R17	6800Ω		BTS-6800	BTS-22K	
R18	5600Ω		BTS-5600	BTS-1.1Meg	
R19	6800Ω		BTS-6800	5%	
R20	1000Ω		BTS-1000	BTS-5 6Meg	
R21	6.8Meg 5%	30685130	BTS-6.8Meg 5%	30182230	
R22	4.5Meg	30155230	BTS-4.5Meg	30182230	
R23	5.6Meg	30565230	BTS-5.6Meg	30182230	
R24	1.5Meg	30155330	BTS-1.5Meg	30474230	
R25	1Meg	30105330	BTS-1Meg	30473230	
R26	680K 5%	30684130	BTS-680K 5%	30182230	
R27	2.5Meg		BTS-2.5Meg	30182230	Note 1
R28	1.8Meg	30185130	BTS-1.8Meg	30182230	
	5%		5%	30182230	
R29	330K 5%	30334130	BTS-330K 5%	30182230	
R30	1Meg	30105230	BTS-1Meg	30182230	
R31	1000Ω	30001030	BTS-1000	30182230	
R32	27K	30272330	BTS-27K	30182230	
R33	330Ω	30331330	BTS-330	30182230	
R34	330Ω	30331330	BTS-330	30182230	
R35	47Ω	30471330	BTS-47	30182230	
R36	1000Ω	30102330	BTS-1000	30182230	
R37	330Ω	30331330	BTS-330	30182230	
R38	47Ω	30470130	BTS-47	30182230	
R39	1000Ω	30102330	BTS-1000	30182230	
R40	180Ω	30181330	BTS-180	30182230	
R41	560Ω 1	30562140	BTA-5600	30182230	
R42	1000Ω	30102330	BTS-1000	30182230	
R43	6800Ω	30682230	BTS-6800	30182230	
R44	4700Ω 5%	30472130	BTS-4700 5%	30182230	
R45	100K 5%	30104130	BTS-100K 5%	30182230	
R46	1Meg	30105230	BTS-1Meg	30182230	
R47	6800Ω	30682330	BTS-6800	30182230	
R48	15K	30153230	BTS-15K	30182230	Note 3
R49	750Ω 5	31000153	PWT-750	30182230	
R50	4700Ω	30472330	BTS-4700	30182230	
R51	33Ω	30330230	BTS-33	30182230	
R52	33Ω	30330230	BTS-33	30182230	
R53	2200Ω	30222330	BTS-2200	30182230	
R54	130K	30134230	BTS-130K	30182230	
R55	22K	30223330	BTS-22K	30182230	

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA CBS-Columbia Part No.	IRC Part No.	NOTES
R56	100Ω		30102310	BTS-1000	
R57	100K		30102330	BTS-100K	
R58	10K	3	30103250	BTS-10K	
R59	12K		30123330	BTS-12K	
R60	120Ω		30121230	BTS-120	
R61	1000Ω		30102330	BTS-1000	
R62	1000Ω		30102330	BTS-1000	
R63	3900Ω	1	31392180	BTS-3900	
R64	22K		30223330	BTS-22K	
R65	1.1Meg 5%		30115130	BTS-1.1Meg 5%	
R66	5.6Meg		30565230	BTS-5 6Meg	
R67	1000Ω		30102330	BTS-1000	
R68	18Meg		30182230	BTS-18Meg	
R69	270K		30274230	BTS-270K	
R70	12K		30123230	BTS-12K	
R71	470K		30474230	BTS-470K	
R72	4700Ω	1	30472230	BTS-4700	
R73	1000Ω		30102230	BTS-1000	
R74	330K		30334230	BTS-330K	
R75	82000Ω		30822230	BTS-8200	
R76	8200Ω		30822330	BTS-8200	
R77	100K		30104230	BTS-100K	
R78	220K		30224230	BTS-220K	
R79	18Meg		30182230	BTS-18Meg	
R80	120K		30134230	BTS-120K	
R81	470K		30474230	BTS-470K	
R82	15K		30153230	BTS-15K	
R83	2.2Meg		30225230	BTS-2.2Meg	
R84	470Ω	1	30471240	BTA-470	
R85	1500Ω		30152330	BTS-1500	
R86	560Ω				
R87	560Ω				
R88	330K		30334230		
R89	330K		30334230	BTS-330K	
R90	330K		30334230		
R91	82K		30823230		
R92	330K		30334230	BTS-330K	
R93	3900Ω		31392230	BTS-3900	
R94	68K		30683230		
R95	22K		30223230		
R96	150K		30154230		
R97	8200Ω		30822330		
R98	47K	1	30473240	BTA-47K	
R99	270K		30274230	BTS-270K	
R100	1Meg		30105230		
R101	100Ω		30101330		
R102	100Ω		30101330		
R103	12K	3	30123250	BTS-12K	

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA CBS-Columbia Part No.	IRC Part No.	NOTES
R104	27K	2	BTB-27K	Note 1	
R105	10Ω	25			
R106	4700Ω	1	30473340		
R107	47K	1	30473240	BTA-47K	
R108	68K		30683230	BTS-68K	

Note 1. Not used in some versions.
Note 2. Some versions use a 22K 1 W resistor in this application. (Part #30123330).
Note 3. Items R10A, R11B, are combined in one unit.

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA CBS-Columbia Part No.	IRC Part No.	NOTES
R109	68K		30683330	BTS-68K	
R110A	33Ω	25	31000498		Note 3
B	11Ω				
R111	7.5Ω	6	31000472	PW10-7.5	
R112	220K	1	30224241	BTA-220K	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA CBS-Columbia Part No.	Halldorson Part No.	Merit Part No.	RCA TYPE No	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
T1	Horiz. Output Trans.	12001271	FB4104P ①	HVO-304 ①	225T1 ①	X084*④	A-8255 * ⑤	FLY-18* ①	D-56 * ⑥
T2	Vert. Output Trans.	10000561	21900①	A-3823	V39T	A-8144	26872	A-108X	
T3A	Yoke (90°) Horiz. (30MH)	16001541②	DF90T	MDF-92 ④⑤	235D1 ④	Y90T18/45 ④	DY-18A ④	Y-16 ④⑤	Y-41-16 ④
B	Vert. (38MΩ)								

① Drill new mounting hole(s).
② Use 5 to 1 turns ratio.
③ Includes capacitor C95, resistors R86 and R87.
④ Use original rear cover and centering device.
⑤ Use original horizontal yoke damping network.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	9	9	9	9	5	9	9
2	7	7	7	7	4	7	7
1	NC See Note ⑤	NC See Note ⑤	NC See Note ⑤	NC See Note ⑤	NC See Note ⑤	NC See Note ⑤	NC See Note ⑤
8	3	3	3	3	2	3	3
7	1	1	1	1	1	1	1
Special Note **	⑥ ⑦	⑥ ⑦	⑥ ⑦	⑥ ⑦	⑥ ⑦	⑥ ⑦	⑥ ⑦

⑥ To reduce yoke "ringing", connect approximately 10000, ½ W in series with capacitor C96.
⑦ To increase width, add capacity (approx. 50-100MMF ⑧ 4KV [MINIMUM] across horizontal yoke terminals #3 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC	REPLACEMENT DATA CBS-Columbia Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T4	2K Ω	3-4Ω	10000741	21111	A-3929	A-3976	24250	S-1X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP	REPLACEMENT DATA CBS-Columbia Part No.	QUAM Part No.	RCA TYPE No	NOTES
SP1	4"	PM	3-4Ω	73001041	4A07	22381	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	SEC	REPLACEMENT DATA CBS-Columbia Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	1st. Video IF	0Ω	.1Ω	12000171	17-5001	TV-125	6323	
L2	Fil. Choke	20Ω		16000851	19-1001		6804	
L3	2nd. Video IF	.1Ω	.1Ω	12000111				
L4	Fil. Choke	20Ω		16000851	19-1001		6804	
L5	3rd. Video IF	.1Ω	.1Ω	12001031				
L6A	4th. Video IF	.1Ω	.1Ω	12001201				
B	2nd. Video IF	1Ω						Includes R64, capacitors and series peaking coil
L7	1st. Sound IF	1.4Ω		15000761				
L8	Series Peaking Coil	1.5Ω			19-1005		6613	9.8 Microhenries Not used in some versions
L9	Series Peaking Coil	7.5Ω		16000041	19-1125		6153	180 Microhenries
L20	Shunt Peaking Coil	1Ω		16000049	19-1500		6174	330 Microhenries
L11	4.5MC Trap	3.3Ω		16000451	19-1004	TV-161	1468	
L12	Series Peaking Coil	1Ω		16001364	19-1250	TV-185	6181	256 Microhenries
L13	Shunt Peaking Coil	1Ω		16000045	19-1500		6174	330 Microhenries
L14	3rd. Sound IF	3.1Ω	3.1Ω	12001151				
L15	Quadrature Coil	4.8Ω		15000721			1481	2.2 Microhenries
L16	RF Choke	1.8Ω		15000702	19-1001		6804	1.8 Microhenries, IRC part #CLA

TRANSFORMER (HORIZ. OSC.)

ITEM No.	USE	DC RES. PRI.	SEC	REPLACEMENT DATA CBS-Columbia Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	RCA TYPE No.	Ram Part No.	Thordarson Part No.	NOTES
L17	22Ω	57Ω		15000741	20-1402	TV-162	6183	230R1	H-100	HB-3	Waveform winding #440

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (@ CURRENT 1000 Cy.)	REPLACEMENT DATA CBS-Columbia Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
L18	.240A	47Ω	1.88 HY	14000182		C3040 ①	C-3974	C-2327 ①	26C43	C-3X

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	CBS-Columbia PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.240A	62000071	1236A	MR300	6S300	6Q4	300	
M2	.240A	62000071	1236A	MR300	6S300	6Q4	300	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CBS-Columbia PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	N	1 6/10A 125V	43000260	43000580	33301.6 (N 1 6/10A)	346016	N 1 6/10	HN1 3/10 to 1 3/4

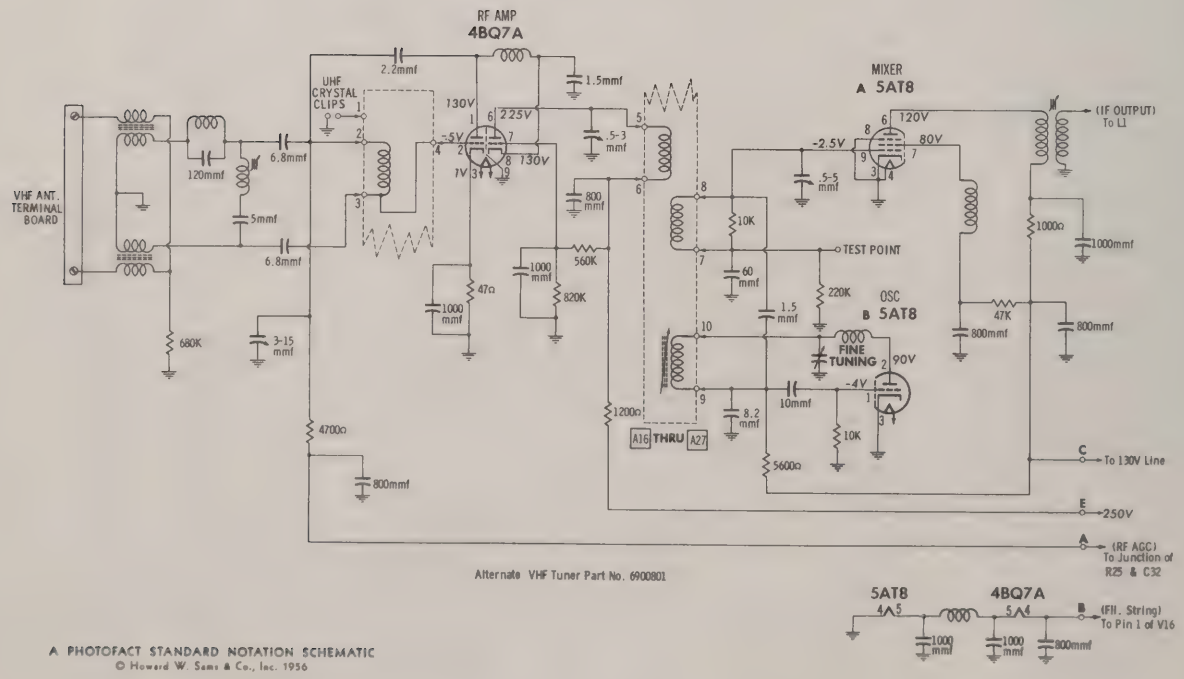
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		CBS-Columbia PART No.	SYLVANIA PART No.	
M4	1N295*	63000092	1N60	Video Detector (Clip in)

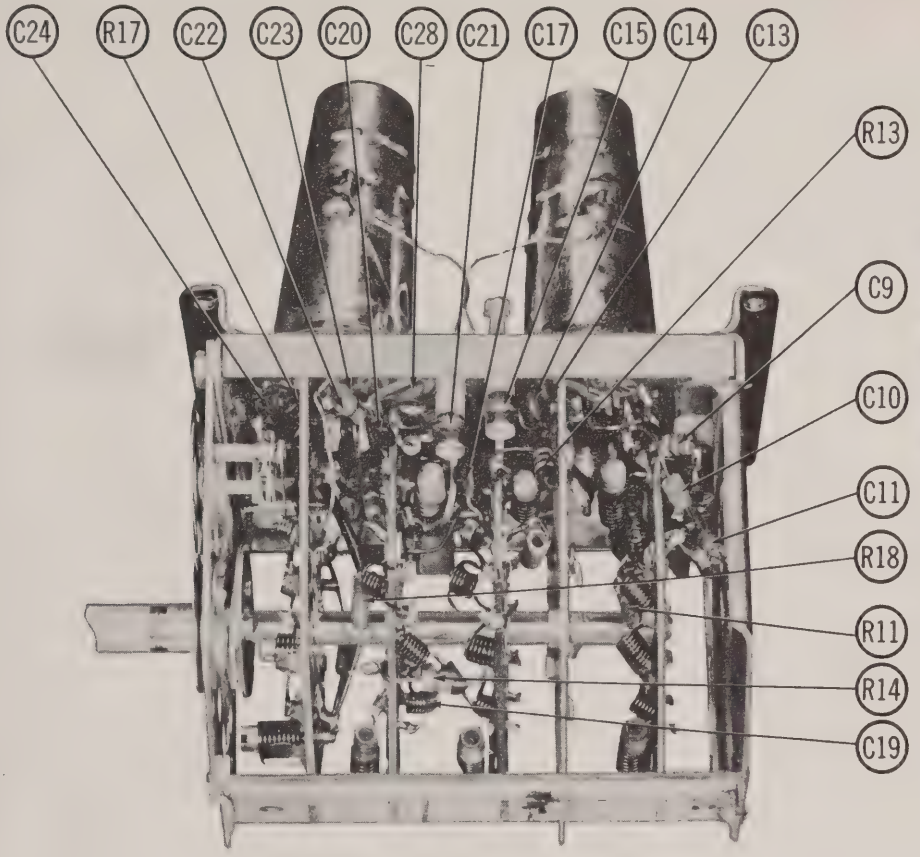
* Some versions may use crystal diode type 1N60 in this application.

MISCELLANEOUS

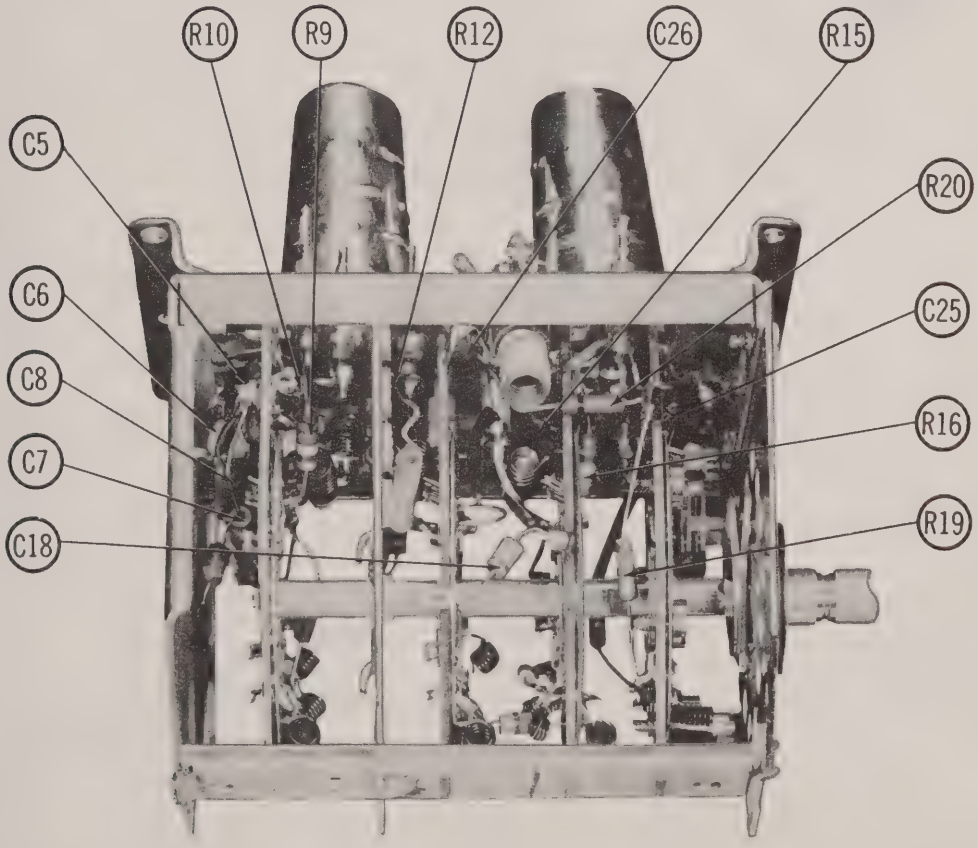
ITEM No.	PART NAME	CBS-Columbia PART No.	NOTES
M5	Tuner	6900081l	VHF - Not used in some versions
	Tuner	69000801	VHF - Not used in some versions
M6	Switch	40000401	Normal - Distant (DPDT - Slide type)
M7	Centering Device		Part of deflection yoke (T3) Rear cover
M8	Ion Trap	19000021	
B3	Trimmer Cap.	25000061	Horiz. Drive (25-280MMF)
	Knob	76004111	Channel selector - Used with tuner part #69000801
	Knob	76004121	Channel selector - Used with tuner part #6900081l
	Knob	76004041	Fine tuning
	Knob	76004051	Secondary controls
	Mask	71001751	
	Safety Glass	77000524	Model 6T301
	Safety Glass	77000522	Models 6T303, 6T304



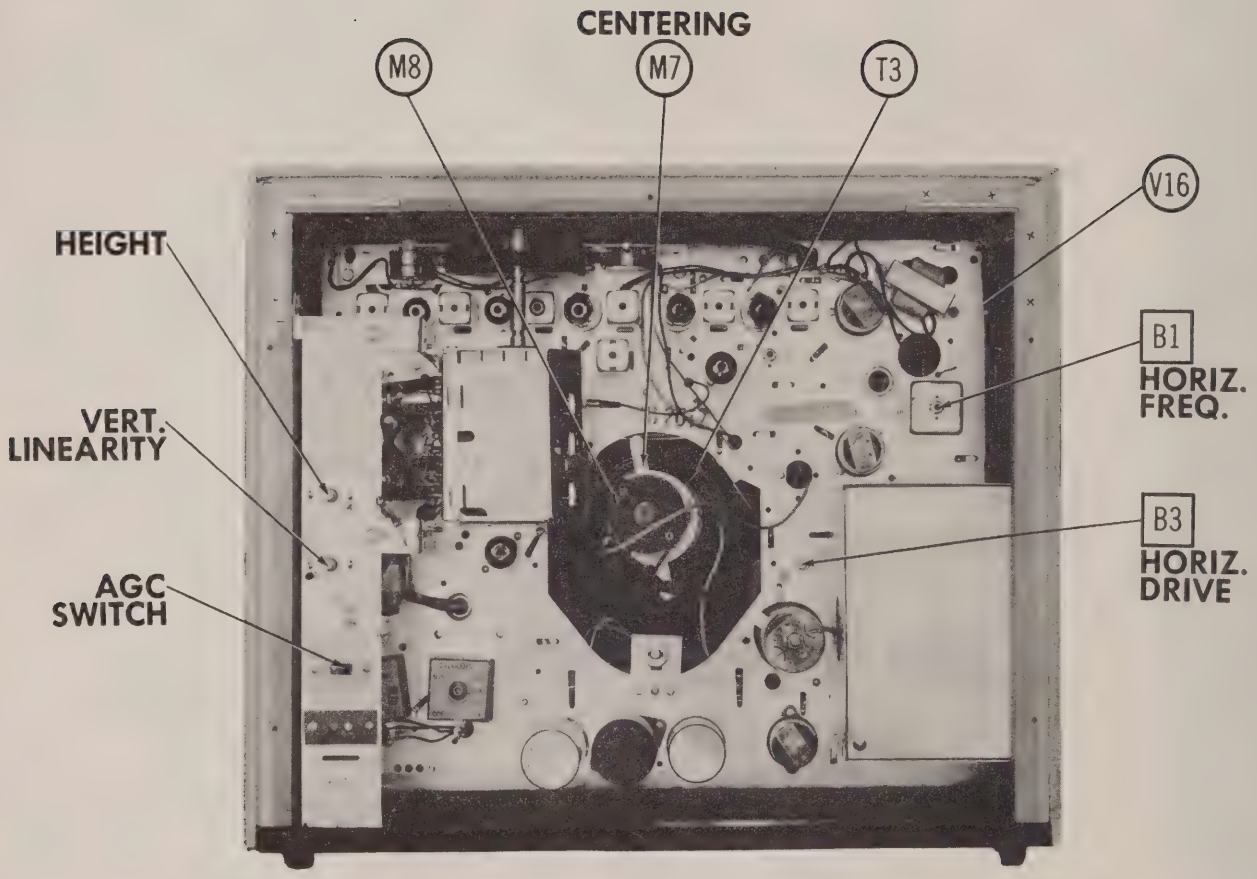
ALTERNATE TUNER SCHEMATIC



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern and adjust the controls for a normal picture. Set the horizontal hold control in the center of its range.

2. Short terminals "C" and "D" of the horizontal oscillator coil (L17) and adjust the horizontal frequency slug (B1) until the picture is in sync horizontally. Set the slug at the center of its range so that the picture remains in sync.

3. Remove the short and connect the vertical amplifier of a scope to terminal "C" of L17 thru a 10MMF capacitor. Low side to chassis.

4. Adjust the horizontal waveform slug (B2) for waveform shown in Fig. 3. The round peak and the sharp peak must be the same amplitude.

5. Adjust B1 so that the picture just begins to fall out of sync with the horizontal hold control fully clockwise.
Using an insulated screwdriver, turn the horizontal drive control (B3) counter clockwise until a bright vertical line appears in the picture, then turn the control clockwise until the line just disappears.

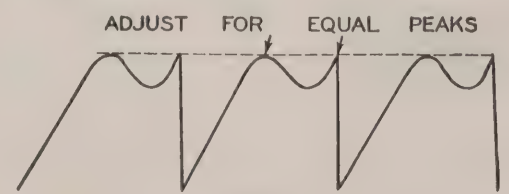
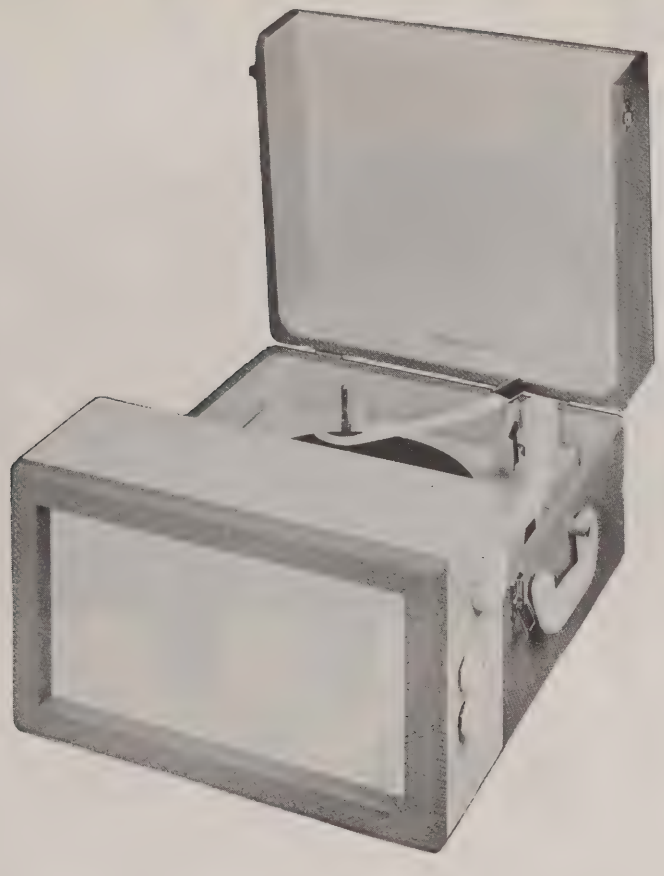


FIG. 3

FIRESTONE
MODEL 4-A-132 (Code 364-5-355)

FIRESTONE
MODEL 4-A-132 (Code 364-5-355)



FIRESTONE
MODEL 4-A-132 (Code 364-5-355)

TRADE NAME	Firestone Model 4-A-132 (Code 364-5-355)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC Operated AM Superheterodyne Receiver With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC	Tuning gang fully closed.	Across voice coil.	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	Tuning gang fully open.	"	A5	"
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 1200 - PHOTOFACT SET 290 -FOLDER 11 OR RECORD CHANGER MANUAL CM-7.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

FIRESTONE MODEL 4-A-132

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF-Amp.	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PR4-200	BBRQ44315C	WQ230			R2199*
B	40	150							
C	20	150							
D	20	25							

*Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	5000		906	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C3	.1	200	804	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C4	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	Note #1.
C5A	220									
B	5000									
C	5000		♦827	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2	
D	250									
E										
C6	5000		906	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C7	.05	200	803	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C8	.05	200	803	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C9	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C10	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C11	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	

Note #1. Not Used In Some Versions.
♦Items C5A, C5B, C5C, C5D, C5E, R9A, R9B, and R9C Are Combined In One Unit. When Replacing Items Separately, C5D And C5E Should Total 250MMF.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	412A	AB-76	A47-2meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to RA
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to RA
R2	500K	½	411					Tone & Switch (Note #1)

Note #1. Some Versions Will Use An Alternate Control Part No. 409 In This Application.

RESISTORS

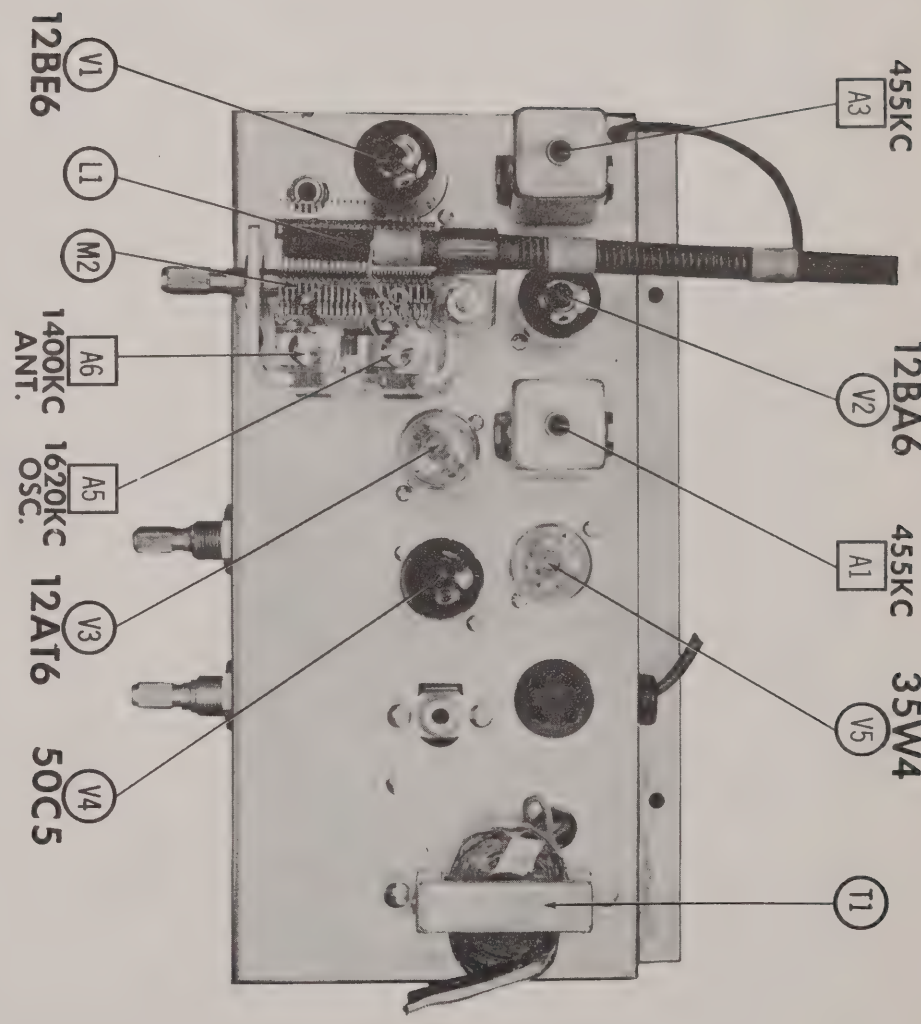
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	22K		517	BTS-22K	
R4	150Ω		505	BTS-150	
R5	2.2meg		615	BTS-2.2Meg	
R6	470K		502	BTS-470K	
R7	47K		523	BTS-47K	
R8	2200Ω			BTS-2200	
R9A	6.8Meg			BTS-6.8Meg	
B	470K		† 827	BTS-470K	
C	470K			BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R10	150Ω		505	BTS-150	
R11	22K		517	BTS-22K	Note #1
R12	270K		529	BTS-270K	
R13	1000Ω	1	607	BTA-1000	
R14	470Ω	1		BTA-470	Note #2
R15	27Ω	2	534		Note #3

† Items R9A, R9B, R9C, C5A, C5B, C5C, C5D, C5E Are Combined In One Unit.
Note #1. Some Versions Use 10K In This Application. (Part #522).
Note #2. Some Versions Use 270Ω 1 W In This Application. (Part #631).
Note #3. Fuse Type Resistor.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3-4Ω	1209C						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6 1/2"	PM	3-4Ω	2627	6A1	229S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.7Ω		1509				
L2	Osc. Coil	7.3Ω		1408				Tapped @ .7Ω
L3	Input IF	12Ω	13Ω	1405	16-6758	BC-352	12-C1	
L4	Output IF	12Ω	13Ω	1406A	16-6758	BC-353	12-C2	

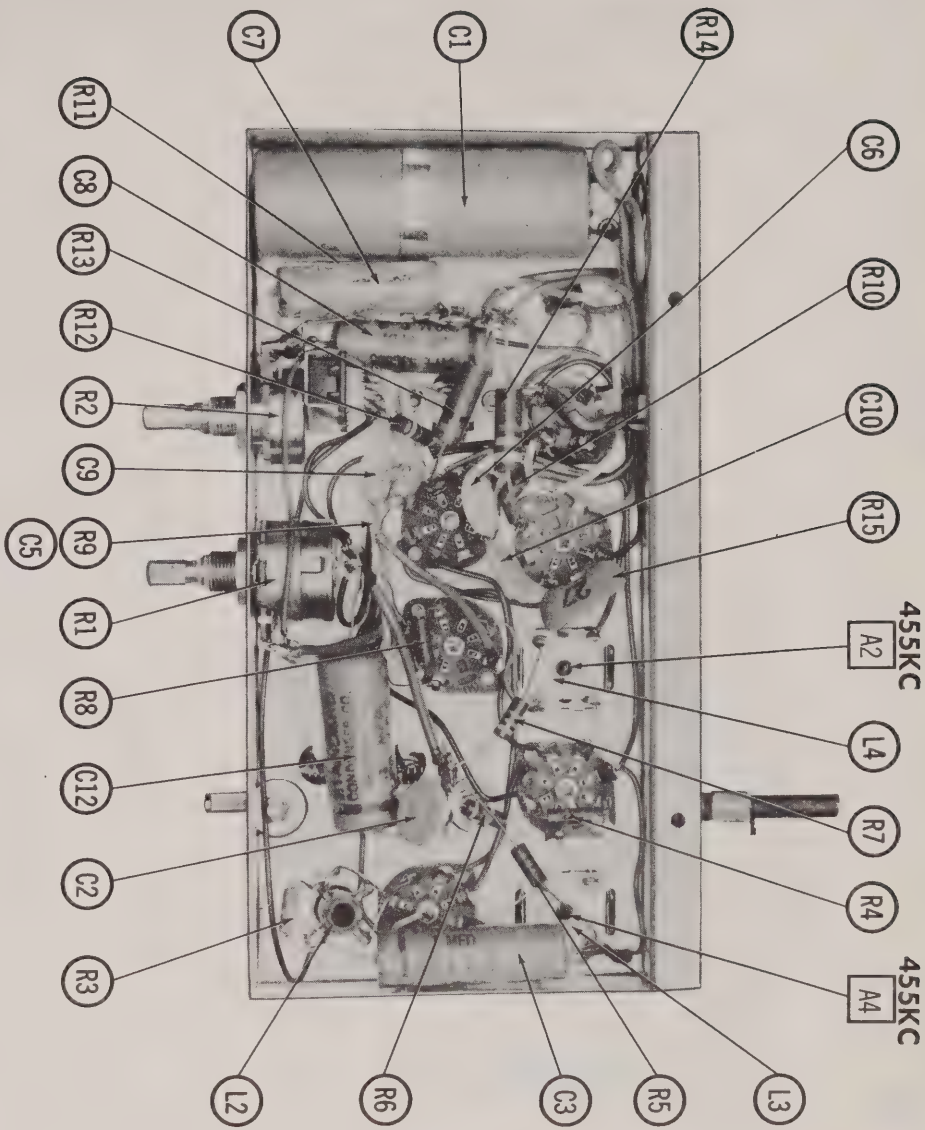
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	FIRESTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1				56		

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	Tuning Cap.	1017	2 Gang (33-400MMF, 11-100MMF)
	Case	2063A	
	Handle	1772	
	Knob	2430B	On-Off-Volume
	Knob	2430A	Tone & Radio-Phono Switch
	Knob	2430	Tuning

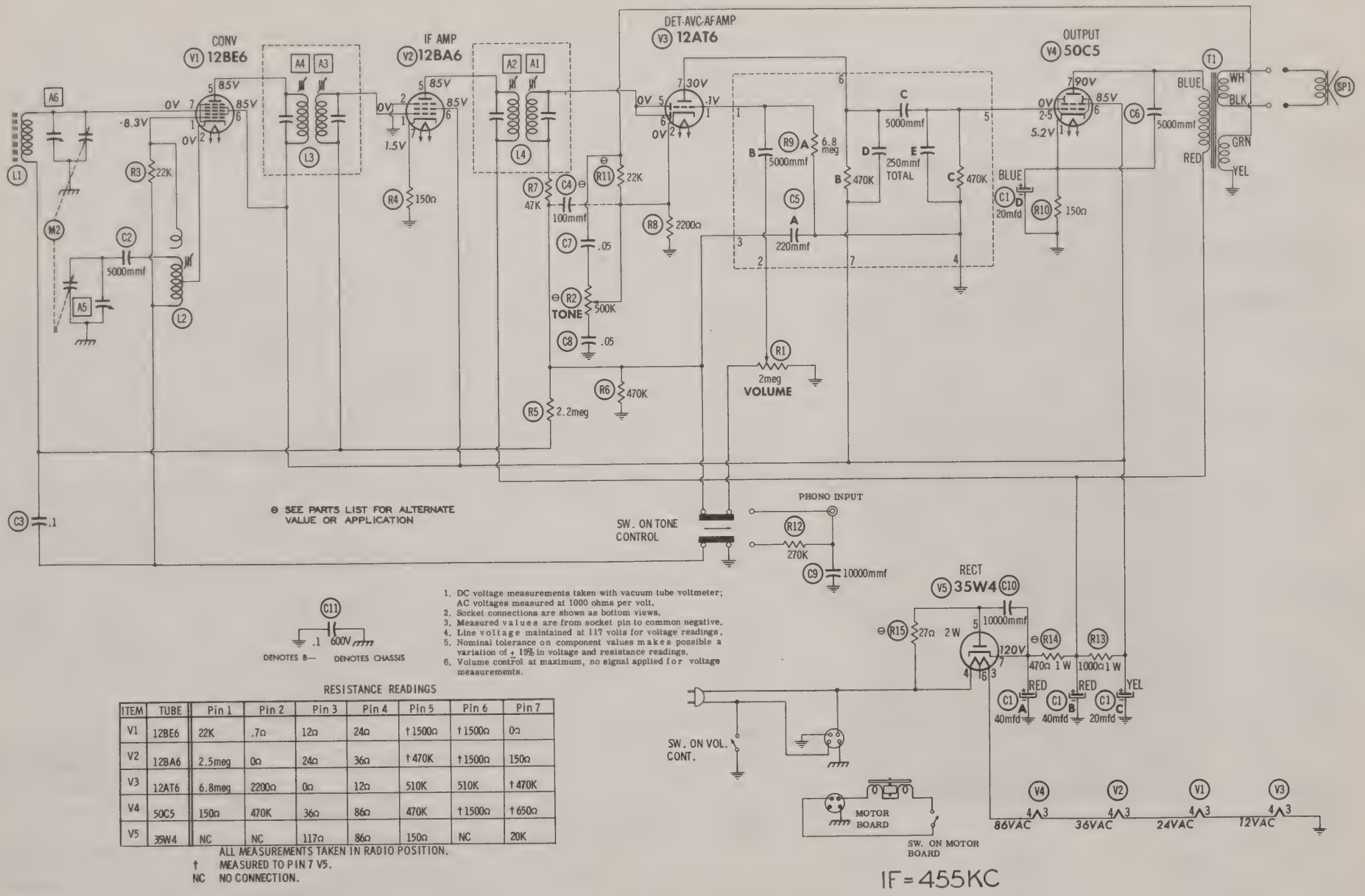
CHASSIS—BOTTOM VIEW



SET 333 FOLDER 5

FIRESTONE MODEL 4-A-132

FIRESTONE MODEL 4-A-132



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	12Ω	24Ω	†1500Ω	†1500Ω	0Ω
V2	12BA6	2.5meg	0Ω	24Ω	36Ω	†470K	†1500Ω	150Ω
V3	12AT6	6.8meg	2200Ω	0Ω	12Ω	510K	510K	†470K
V4	50C5	150Ω	470K	36Ω	86Ω	470K	†1500Ω	†650Ω
V5	35W4	NC	NC	117Ω	86Ω	150Ω	NC	20K

ALL MEASUREMENTS TAKEN IN RADIO POSITION.
† MEASURED TO PIN 7 V5.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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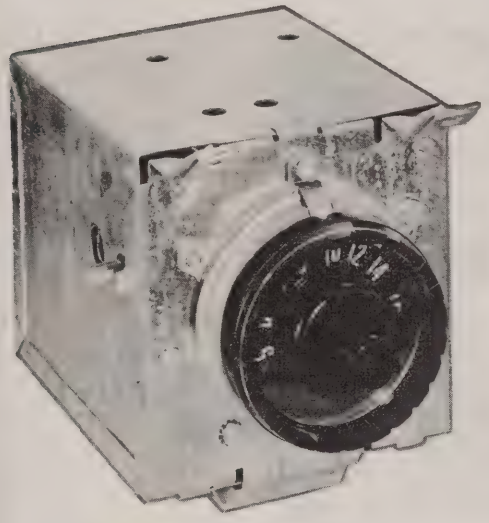
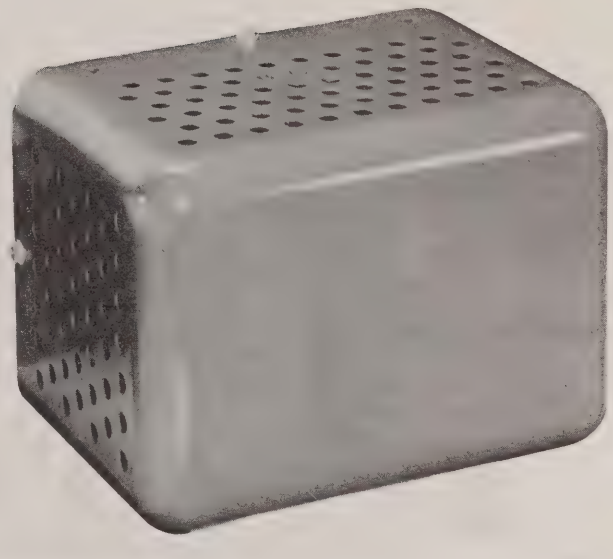
FORD
MODEL 6BFT (FDV-18805-A)





TRADE NAME	Ford Model 6BFT (FDV-18805-A) (For 1956 Ford Trucks)
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore, Md.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 12AQ5 Output, 12X4 Rectifier.
POWER SUPPLY	12 Volt Storage Battery
RATING	3.2 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fig. 1	Thru dummy to antenna receptacle.	265KC (400% mod.)	650KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1605KC	High frequency end of dial.	"	A5, A6 A7	"
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1600KC, adjust A7 for maximum volume.						
	The following steps are necessary only in case of core or tuning coil replacement.						
4.				High frequency end of dial.	Across voice coil.	A8, A9, A10	Adjust tuner cores so that they remain in coil forms but out of coils.
5.	Fig. 1	Thru dummy to antenna receptacle.	1605KC	"	"	A5, A6, A7	Adjust for maximum output in order given.
6.	"	"	1200KC	1200KC	"	A10, A9, A8	"
7.	"	"	1605KC	High frequency end of dial.	"	A5, A6, A7	Adjust for maximum output in order given. Repeat steps 6 & 7 but adjust A8, 9 & 10 at 1200KC only.

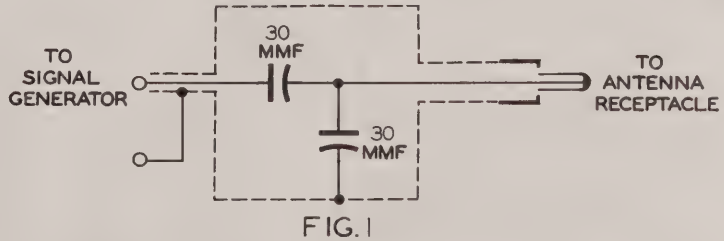


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det. -AVC-AF Amplifier	12AV6	
V5	Output	12AQ5	
V6	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BENDIX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	C-220108-5	AFH3-106	C096	FP345.8	TMT-91	T-465	TVL-3634
B	▲10	300							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BENDIX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	120		L-220348-504	NPO-SI120	D6-121	TZ32	811-121		5TCC-Q12	
C3	100		C-220095-3	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C4	.1	200	C-220098-8	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C5	.1	400	C-220098-6	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C6	47		C-220095-4	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C7	220		L-220350-602	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C8	22		C-220095-16	N750-DI22	TCN-22	N024	N750K-220		5TCU-Q22	
C9	47		C-220095-4	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C10	50		C-220095-30	N750-DI47	TCN-50	N034	N750K-500	NT-5447	5TCU-Q47	
C11	.02	200	C-220098-4	BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C12	.0082	400	C-220098-49							
C13	.003	200	C-220098-50	SI3000	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C14	.003	200	C-220098-50	SI3000	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C15	.008	1600	C-220098-16	P1688N-008	DD16-802	CUB16D8		PT1628	MB-D8	
C16	.5	100	C-220098-10	VHC36		MP2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BENDIX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	L219683-1	F1-67			UE1746S	Tone (Panel) Note #1.
B	500K	½		R2-41				Volume Tapped at 100K (Rear)
C	Switch			KB-4				Attach to R1B
R2	3000	2	C219555-9		39-3000		FL-4K	Sensitivity (Wire-Wound)

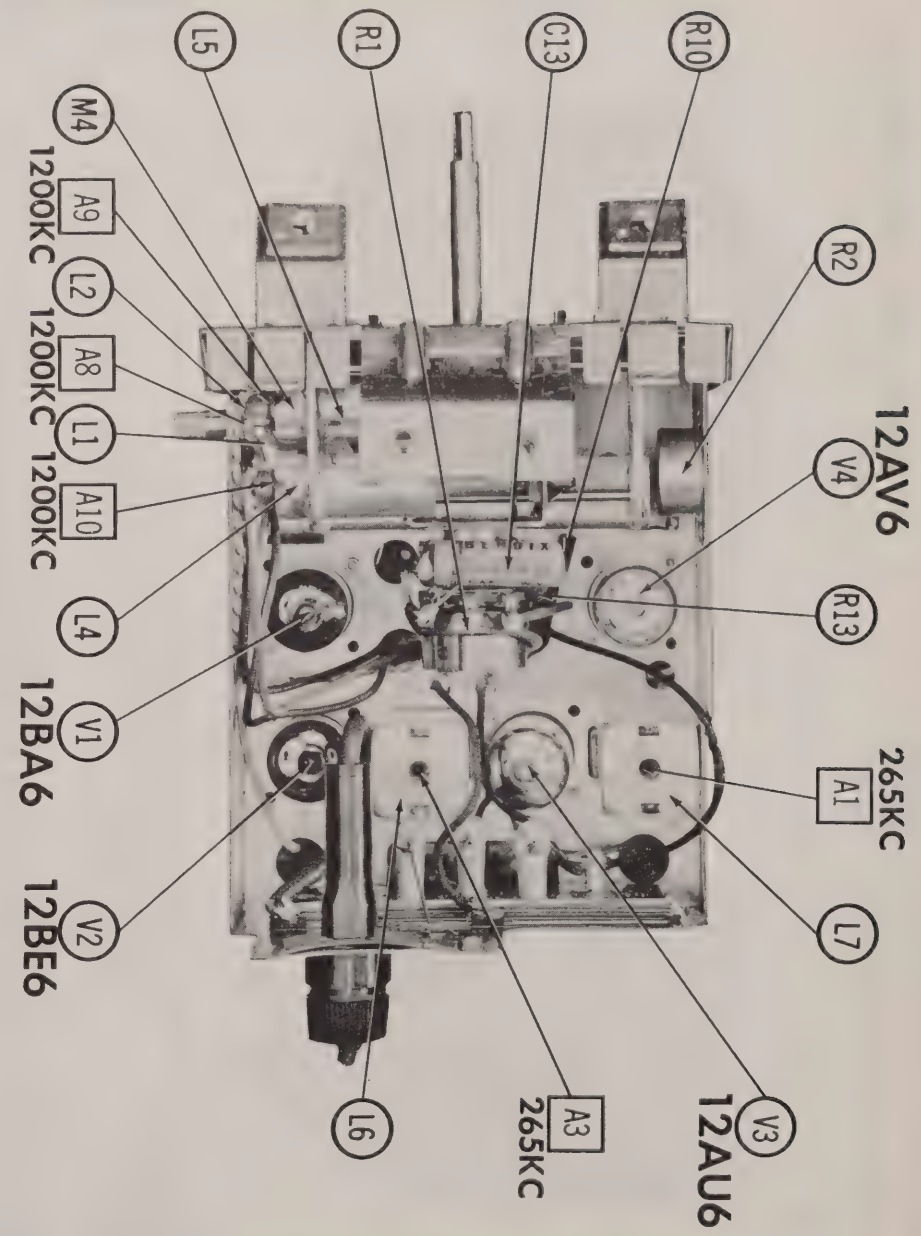
Note #1. Some versions may use an alternate control Part No. L217683-1 in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BENDIX PART No.	IRC PART NO.
R3	470K		C-220551B-474M	BTS-470K
R4	22Meg		C-220551B-226M	BTS-22Meg
R5	220K		C-220551B-224M	BTS-220K
R6	100Ω		C-220551B-101M	BTS-100
R7	47K		C-220551B-473M	BTS-47K
R8	68Ω		C-220551B-680M	BTS-68
R9	15K	2	C-220551D-153M	BTS-15K
R10	220Ω		C-220551B-221M	BTS-220
R11	1.5Meg		C-220551B-155M	BTS-1.5Meg
R12	47K		C-220551B-473M	BTS-47K
R13	82K		C-220551B-823K	BTS-82K
R14	10Meg		C-220551B-106M	BTS-10Meg
R15	330K		C-220551B-334M	BTS-330K
R16	220K		C-220551B-224M	BTS-220K
R17	270Ω	1	C-220551C-271K	BTA-270
R18	1000Ω	1	C-220551C-102K	BTA-1000
R19	180Ω	1	C-220551C-181K	BTA-180
R20	180Ω	1	C-220551C-181K	BTA-180

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6V @ 1.66A	520VCT @ .053A			L-291818-1	V3903	P-2861	P-6489	22R52	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BENDIX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6.5KΩ	3-4Ω	L291817-1	Z1007	A-3020	A-3849	26S49	S-5Z	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	BENDIX PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5" x 7"	PM	3-4Ω	N-222095-1	57A15	257S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	BENDIX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling Coil	0Ω		C-216123-1				
L2	Ant. Coil	13.5Ω						Part of M4.
L3	IF Trap			C-216231-1				Wound on 10KΩ 2 Watt Resistor
L4	RF Coil	13.5Ω						Part of M4
L5	Osc. Coil	.6Ω	2.7Ω					Part of M4
L6	Input IF	48Ω	48Ω	L-291714-5	16-6752	BC-350	12-H1	
L7	Output IF	50Ω	42Ω	L-291807-1	16-6754	BC-354	12-H6	
L8	Vib. Hash Choke	.2Ω		C-216162-4				107 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				BENDIX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115Ω	C-221139-1	6330	G-883	6330	

FUSES

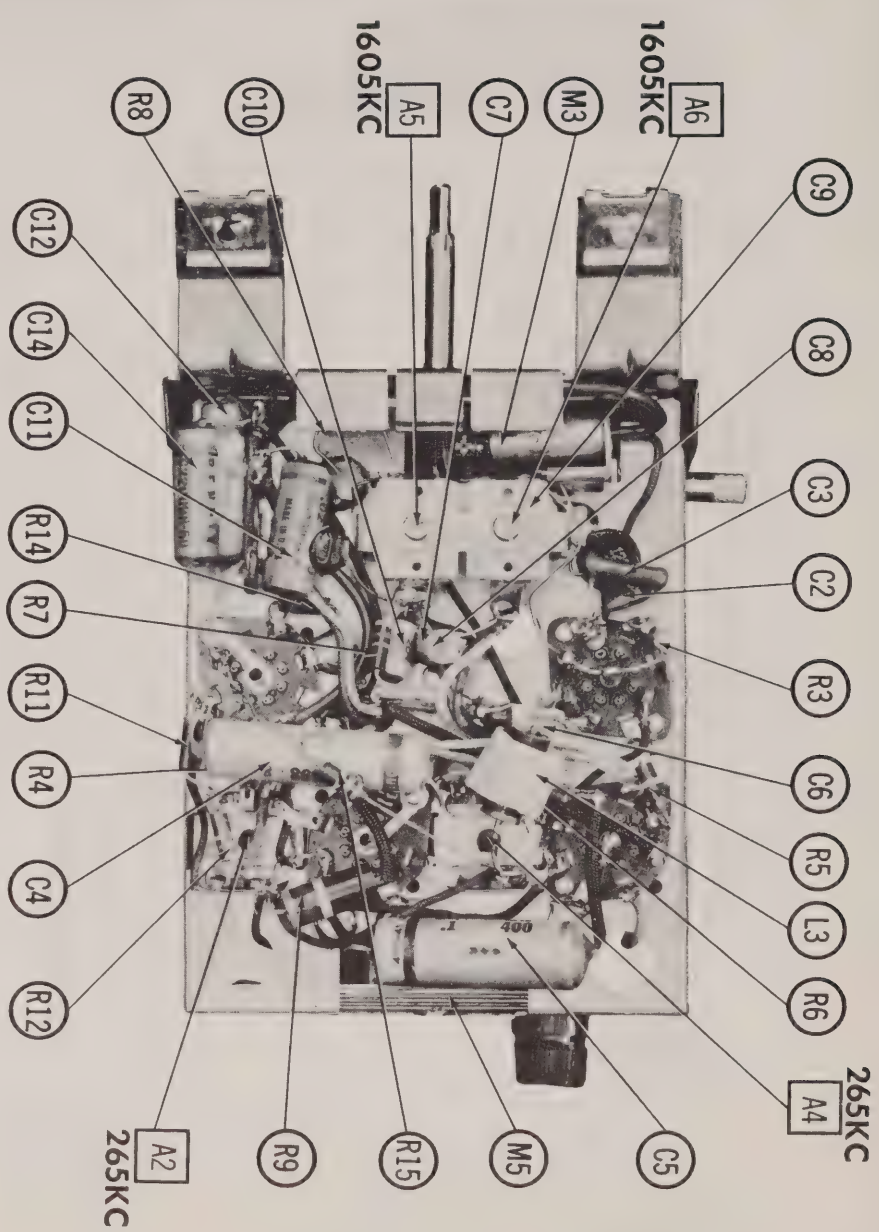
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BENDIX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	7AG	7 1/2A 32V	C-221631-1	C-233499-1	30307.5 (7AG 7 1/2A)	155009	AGN 7 1/2	HRH

MISCELLANEOUS

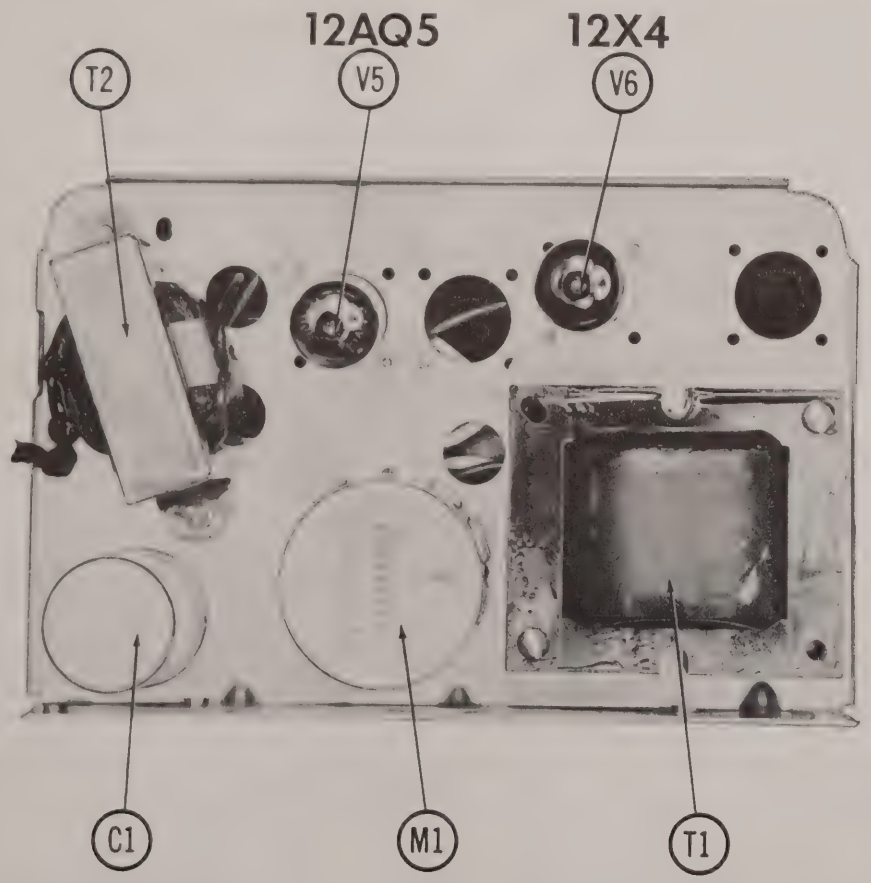
ITEM No.	PART NAME	BENDIX PART No.	NOTES
M3	Dial Light	C-221319-3	#57
M4	Tuner	N-220981-1 *	Permeability (Complete), Includes L2, L4, L5.
M5	Spark Plate	L-221473-1	
A5	Trimmer Cap.	L-219095-1	Osc. (430-490MMF.)
A6	Trimmer Cap.		RF (5-80MMF.)
A7	Trimmer Cap.	L-219093-1	Ant. (5-80MMF.)
	Knob	L-294705-1	Tuning
	Knob	C-294707-1	On-Off-Volume
	Knob	C-655139-1	Tone
	Dial Glass	N-676225-1	
	Dial Pointer	C-676229-1	

* Alternate Part #N-221463-1

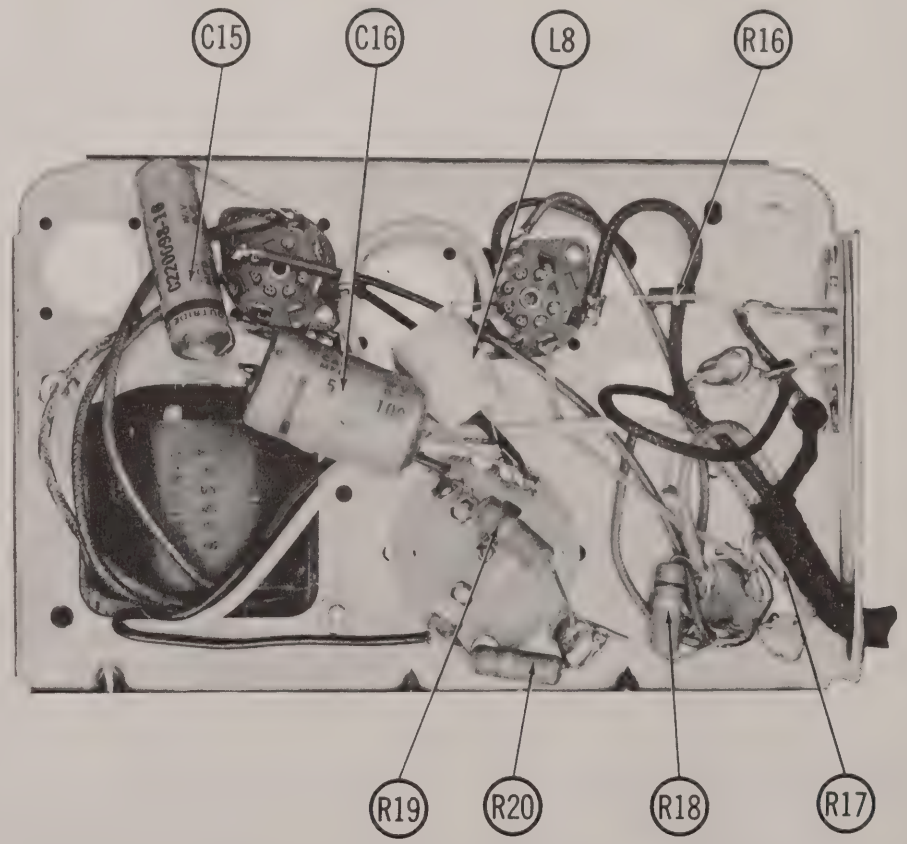
CHASSIS—BOTTOM VIEW

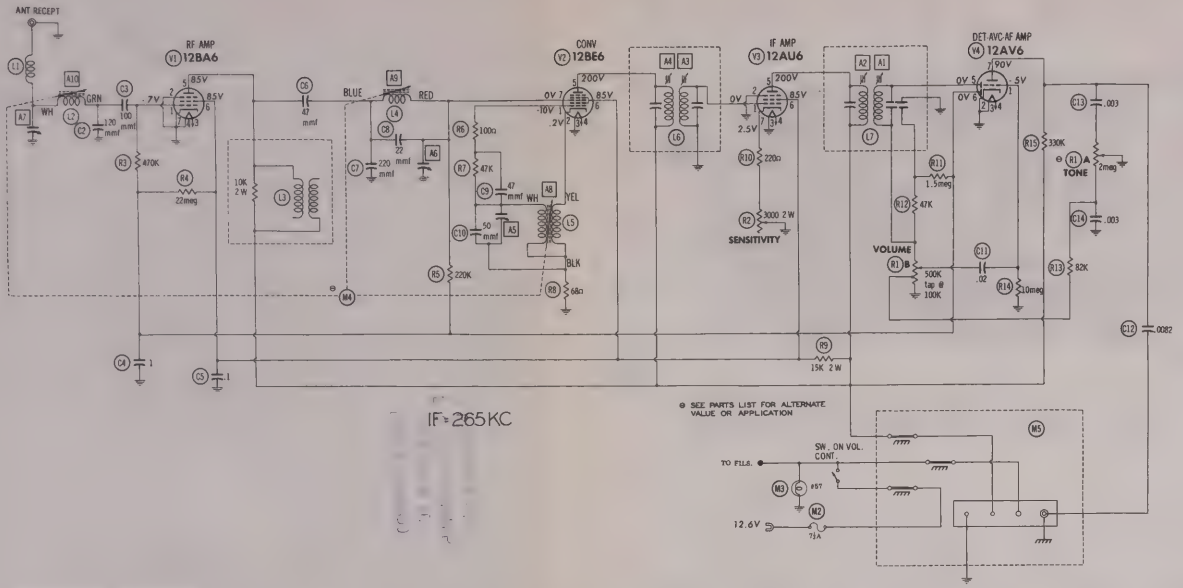


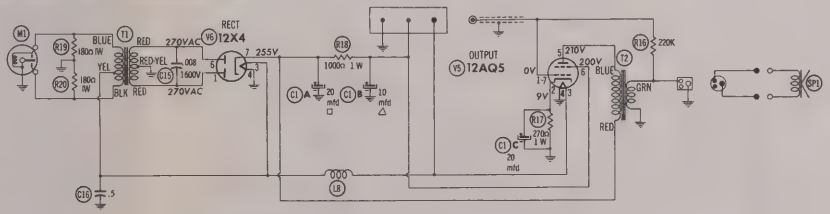
POWER SUPPLY — TOP VIEW



POWER SUPPLY — BOTTOM VIEW







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	1.8Meg	0Ω	1.3Ω	0Ω	†11K	†16K	0Ω
V2	12BE6	47K	68Ω	0Ω	1.3Ω	†1000Ω	†16K	1.6Meg
V3	12AU6	46Ω	0Ω	0Ω	1.3Ω	†1000Ω	†16K	2000Ω
V4	12AV6	10Meg	0Ω	0Ω	1.3Ω	470K	2Meg	†330K
V5	12AQ5	220K	270Ω	1.3Ω	0Ω	†620Ω	†1000Ω	220K
V6	12X4	330Ω	NC	1.3Ω	0Ω	NC	300Ω	15K

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 13.6 volts for voltage readings.
5. Nominal tolerances on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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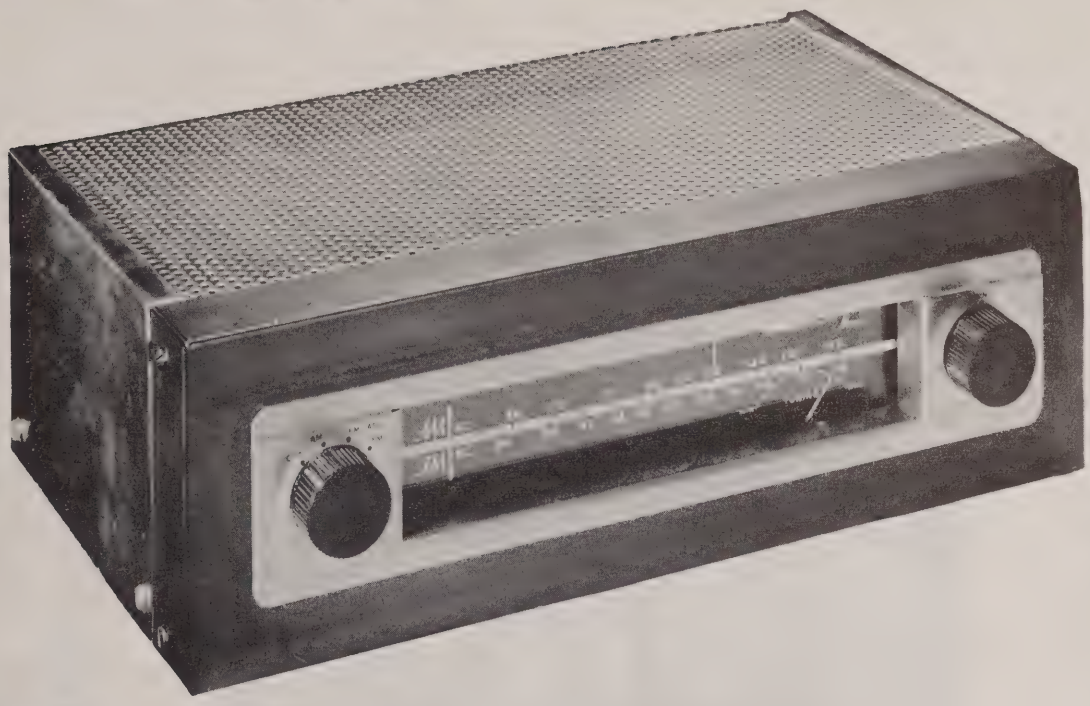
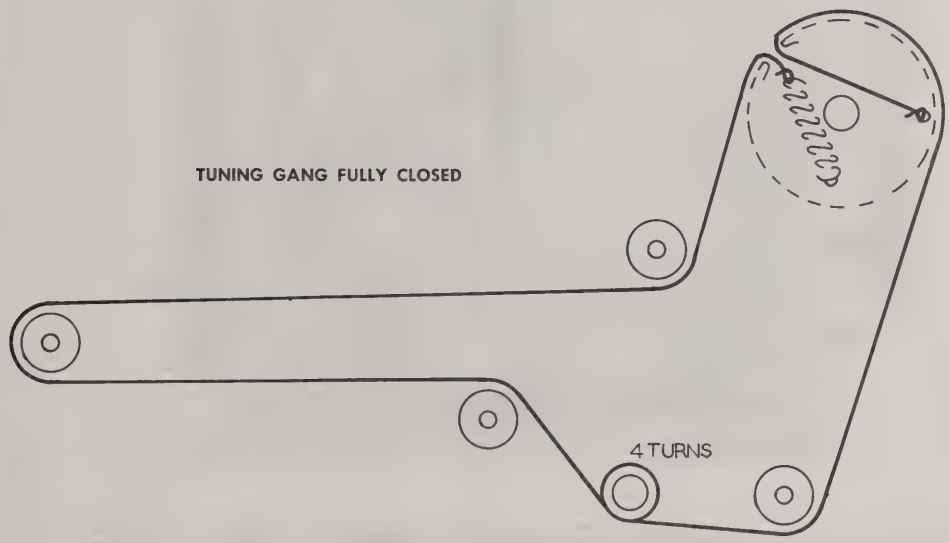
RETMA MEMBER



HARMAN KARDON
MODEL A-310

TRADE NAME	Harman-Kardon Model A-310		
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L. I., N. Y.		
TYPE SET	AC Operated FM-AM Superheterodyne Tuner		
TUBES	Twelve		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING	.35 Amp. @ 117 Volts AC
TUNING RANGE--BROADCAST	530KC - 1650KC	FM	88MC - 108MC

HARMAN KARDON
MODEL A-310



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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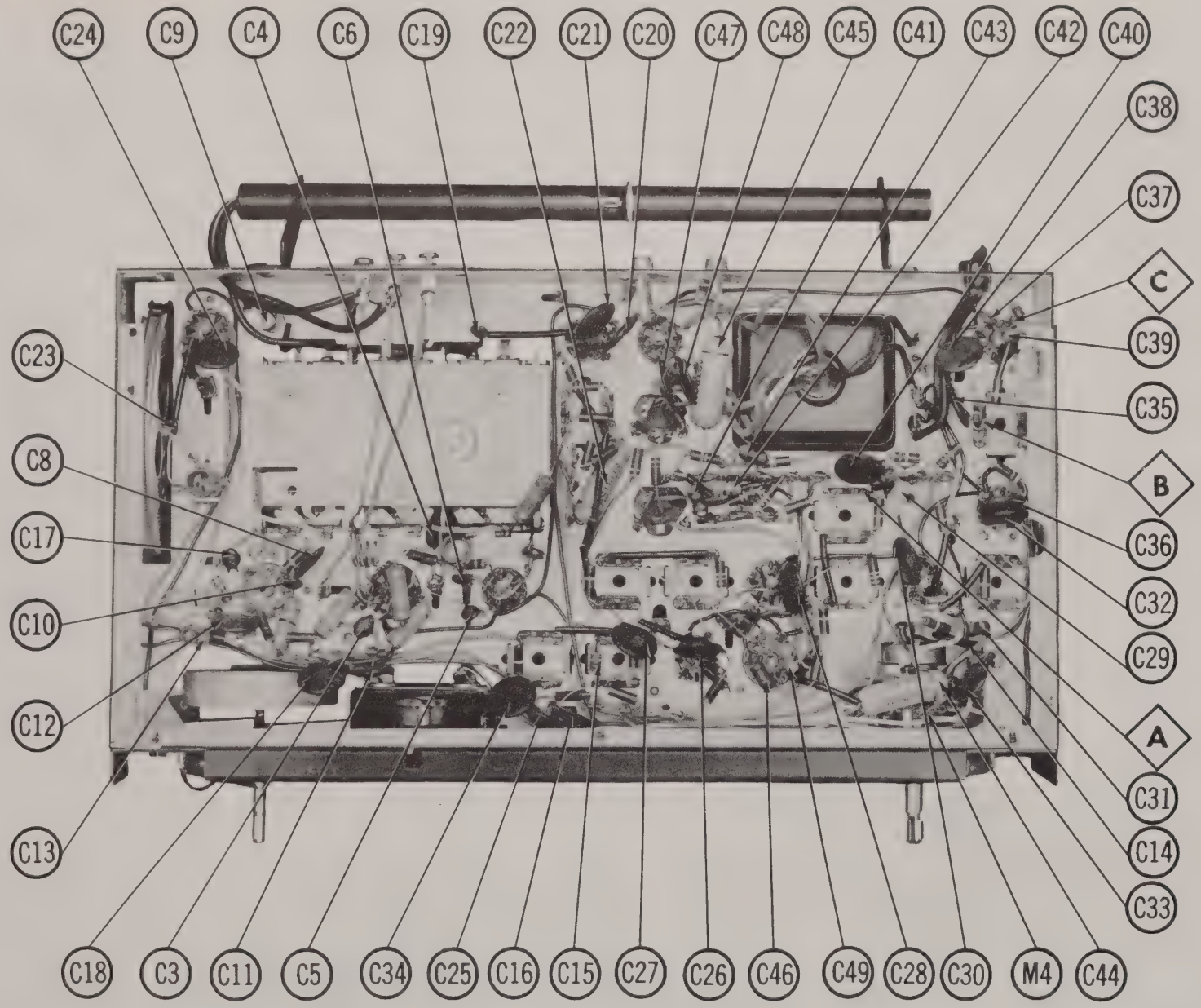
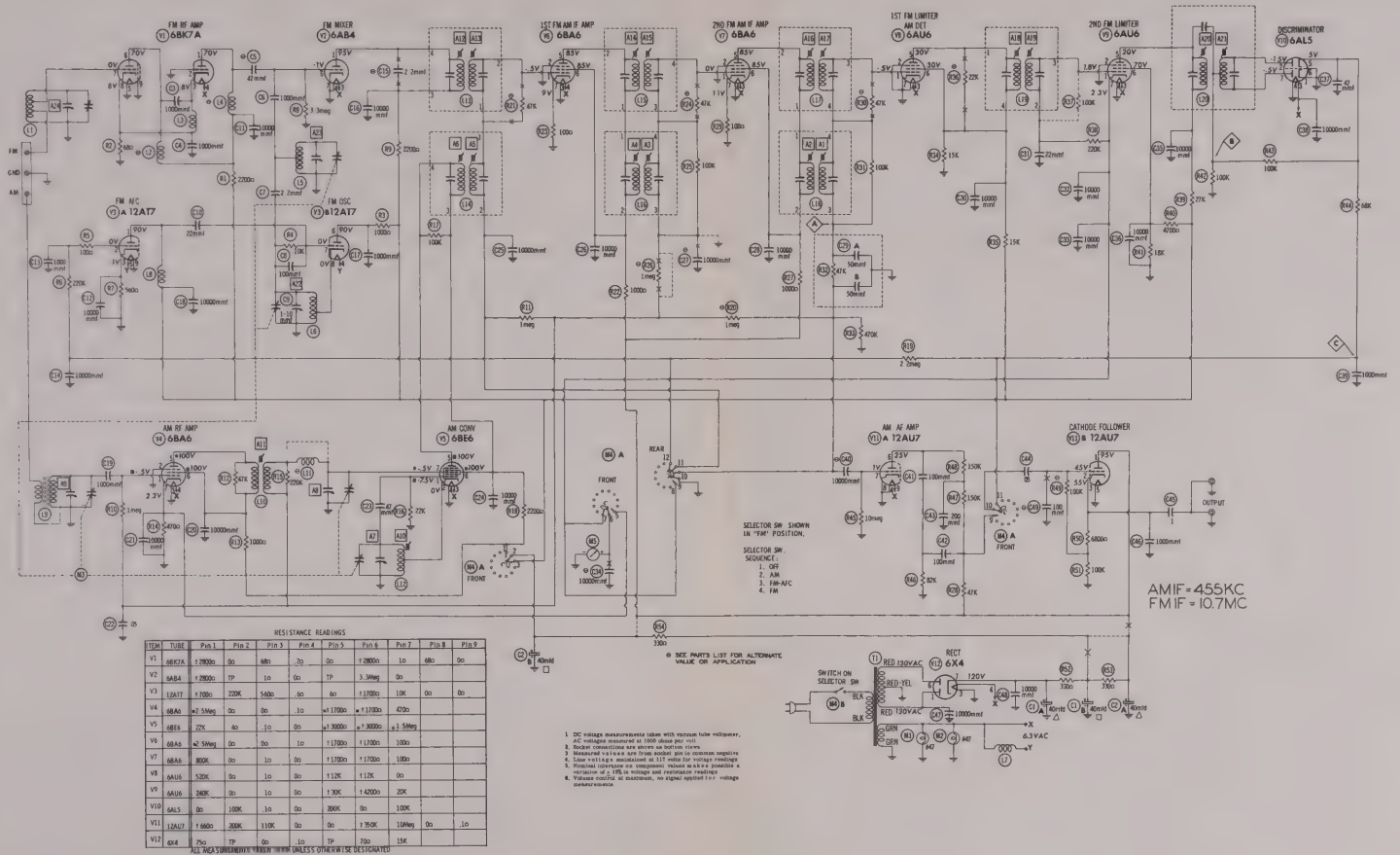


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BK7A	†2800Ω	0Ω	68Ω	.2Ω	0Ω	†2800Ω	1Ω	68Ω	0Ω
V2	6AB4	†2800Ω	TP	1Ω	0Ω	TP	3.3Meg	0Ω		
V3	12AT7	†700Ω	220K	560Ω	.5Ω	6Ω	†1700Ω	10K	0Ω	0Ω
V4	6BA6	*2.5Meg	0Ω	0Ω	.1Ω	*1700Ω	*1700Ω	47Ω		
V5	6BE6	22K	4Ω	.1Ω	0Ω	*3000Ω	*3000Ω	3.5Meg		
V6	6BA6	*2.5Meg	0Ω	0Ω	1Ω	†1700Ω	†1700Ω	100Ω		
V7	6BA6	800K	0Ω	1Ω	0Ω	†1700Ω	†1700Ω	100Ω		
V8	6AU6	520K	0Ω	1Ω	0Ω	†12K	†12K	0Ω		
V9	6AU6	260K	0Ω	1Ω	0Ω	†30K	†4200Ω	20K		
V10	6AL5	0Ω	100K	1Ω	0Ω	260K	0Ω	100K		
V11	12AU7	†660Ω	300K	110K	0Ω	0Ω	†750K	10Meg	0Ω	.1Ω
V12	6X4	750	TP	0Ω	.1Ω	TP	70Ω	15K		

ALL MEASUREMENTS TAKEN WITH UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 7 OF V12.
* MEASURED IN AM POSITION
TP TIE POINT

@ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 cycles per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

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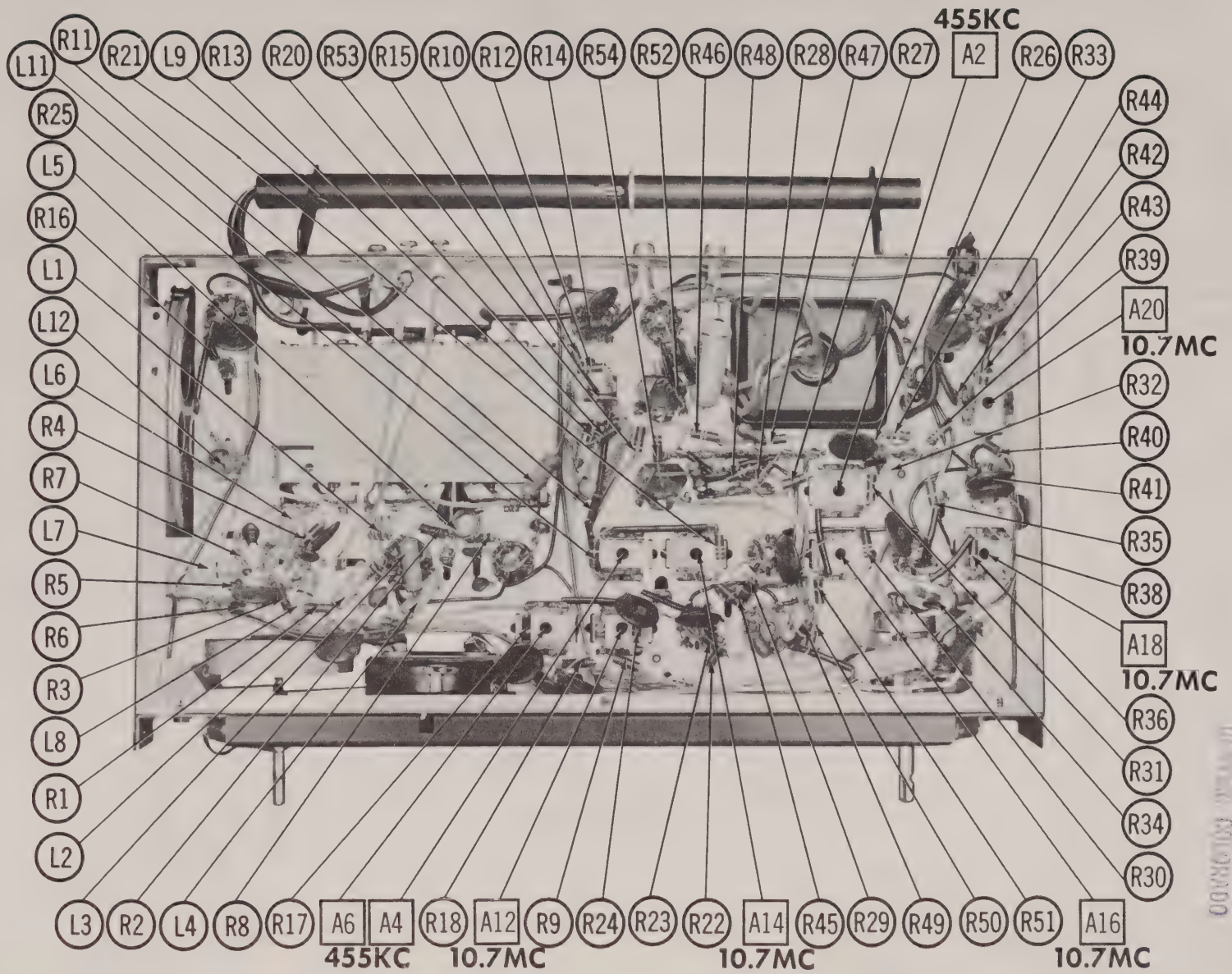
333-7



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. HAWKENSHIP
[illegible] ST.
[illegible], COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open.	Across output terminals.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	200MMF	Across AM antenna terminals.	1500KC	"	1500KC	"	A7, A8, A9	"
3.	"	"	600KC	"	600KC	"	A10, A11	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use 100K resistor in series with DC probe.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe thru 100K to point (A). Common to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A18, A19, A20	"
6.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis.	A21	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

Use 100K resistor in series with vert. amp.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 6 (grid) of 6AB4 (V2)., Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. thru 100K to point (A) Low side to chassis.	A12, A13, A14, A15, A16, A17	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. thru 100K to point (B). Low side to chassis.	A18, A19, A20	"
6.	"	"	"	"	"	Vert. amp. thru 100K to point (C). Low side to chassis.	A21	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A20 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Use 100K resistor in series with DC probe.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100K to point (A) Common to chassis.	A22, A23, A24	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	"	"

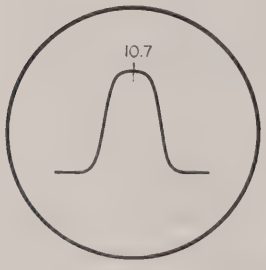


FIG. 1

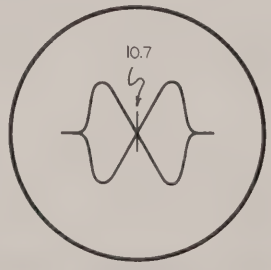


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer	6AB4	
V3	FM AFC-Osc.	12AT7	
V4	AM RF Amplifier	6BA6	
V5	AM Converter	6BE6	
V6	1st IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V7	2nd IF Amplifier	6BA6	
V8	FM IF Amp. -AM Det.	6AU6	
V9	FM Limiter	6AU6	
V10	Discriminator	6AL5	
V11	AM AF Amp. - Cathode Follower	12AU7	
V12	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

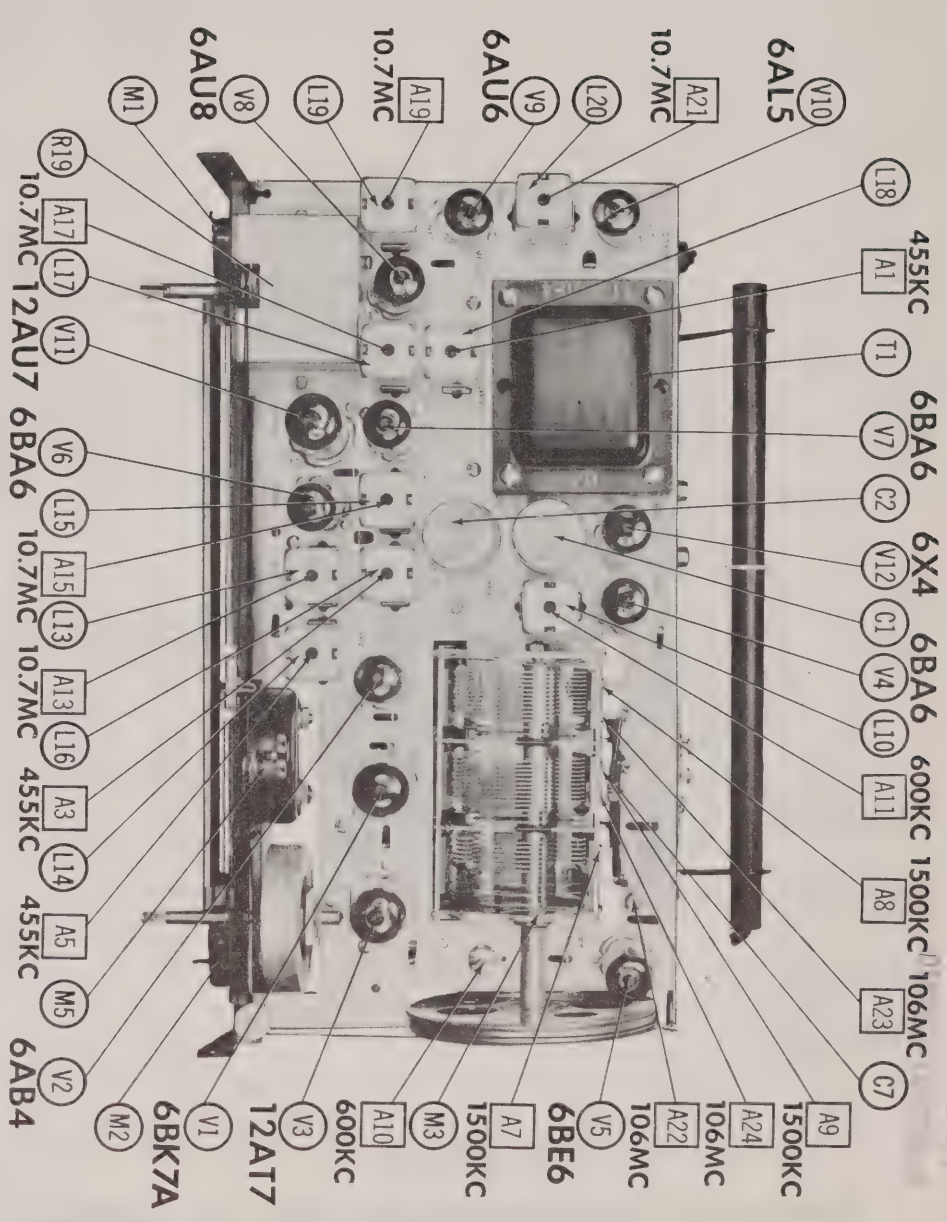
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	150	JE22637	AFH2-14	XB002	FP212	TMD-11	D-060	TVA-2445
B	■40	150							
C2A	▲40	150	JE22637	AFH2-14	XB002	FP212	TMD-11	D-060	TVA-2445
B	■40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C4	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C5	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	Note 1
C6	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C7	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	
C8	100			N750-DI100	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C9	1-10									
C10	22			N750-DI22	TCN-22	TN06	N750K-220		5TCU-Q22	
C11	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C12	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C13	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C14	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C15	2.2			NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2		5TCCB-V22	Note 2
C16	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C17	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C18	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C19	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C20	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C21	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C22	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C23	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C24	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C25	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C26	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C27	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 2
C28	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C29A	50		††	†PA-99	†PC-52	†111TM3	†1403-03	UC-545	†D-3	
B	50							UC-545		
C30	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C31	22			SI22	D6-220		831-220	UC-5422	5GA-Q22	
C32	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C33	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C34	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 2
C35	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C36	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C37	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C38	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C39	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C40	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 3
C41	100			NP0-SI100	D6-101	TZ30	801-101	ZT-531	5TCC-T1	
C42	100			NP0-SI100	D6-101	TZ30	801-101	ZT-531	5TCC-T1	
C43	200			1469-0002	D6-201	TZ30	811-201	MCR237	MS-32	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harmon-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C45	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C46	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C47	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C48	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C49	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	Note 2

† Items C29A, C29B and R32 are combined in one unit.
Note 1: Some versions may use 10MMF in this application.
Note 2: Not used in some versions.
Note 3: Some versions may use 5000MMF in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Harman-Kardon PART No.	IRC PART No.	NOTES
R1	2200Ω			BTS-2200	
R2	68Ω			BTS-68	
R3	1000Ω			BTS-1000	
R4	10K			BTS-10K	
R5	100Ω			BTS-100	
R6	220K			BTS-220K	
R7	560Ω			BTS-560	
R8	3.3Meg			BTS-3.3Meg	
R9	2200Ω			BTS-2200	
R10	1Meg			BTS-1Meg	
R11	1Meg			BTS-1Meg	
R12	47K			BTS-47K	
R13	1000Ω			BTS-1000	
R14	470Ω			BTS-470	
R15	220K			BTS-220K	
R16	22K			BTS-22K	
R17	100K			BTS-100K	
R18	2200Ω			BTS-2200	
R19	2.2Meg			BTS-2.2Meg	
R20	1Meg			BTS-1Meg	
R21	47K			BTS-47K	Note 1
R22	1000Ω			BTS-1000	
R23	100Ω			BTS-100	
R24	47K			BTS-47K	Note 1
R25	100K			BTS-100K	
R26	1Meg			BTS-1Meg	Note 1

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Harman-Kardon PART No.	IRC PART No.	NOTES
R27	1000Ω			BTS-1000	
R28	47K			BTS-47K	
R29	100Ω			BTS-100	
R30	47K			BTS-47K	Note 1
R31	100K			BTS-100K	
R32	47K		†	BTS-47K	
R33	470K			BTS-470K	
R34	15K			BTS-15K	
R35	15K			BTS-15K	
R36	22K			BTS-22K	Note 1
R37	100K			BTS-100K	Note 1
R38	220K			BTS-220K	
R39	27K			BTS-27K	
R40	4700Ω			BTS-4700	
R41	18K			BTS-18K	
R42	100K			BTS-100K	
R43	100K			BTS-100K	
R44	68K			BTS-68K	
R45	10Meg			BTS-10Meg	
R46	82K			BTS-82K	
R47	150K			BTS-150K	
R48	150K			BTS-150K	
R49	100K			BTS-100K	Note 2
R50	6800Ω			BTS-6800	
R51	100K			BTS-100K	
R52	330Ω			BTS-330	
R53	330Ω			BTS-330	
R54	330Ω			BTS-330	

† Items R32, C29A and C29B are combined in one unit.
Note 1: Not used in some versions.
Note 2: Some versions use 470K resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .35A	260VCT @ .051A	6.3VAC @ 4A		FT481054					

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

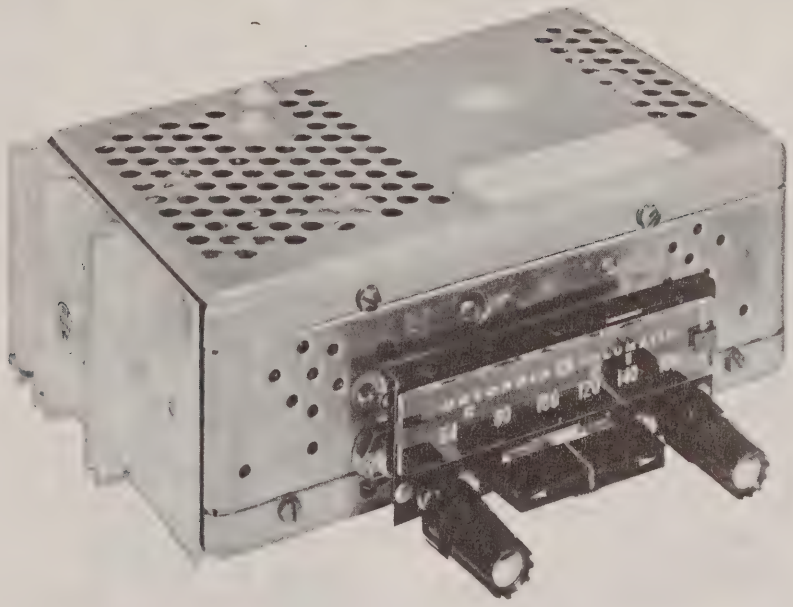
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω						Tapped
L2	RF Choke	.1Ω						.24 Microhenries, IRC part #CLA - Note 1
L3	Cathode Choke	.1Ω						.24 Microhenries, IRC part #CLA
L4	RF Choke	3Ω						3.3 Microhenries, IRC part #CLA - Note 2
L5	FM RF Coil	0Ω						Tapped
L6	FM Osc. Coil	0Ω						Tapped
L7	Fil. Choke	.5Ω			19-1000		4602	1 Microhenry, IRC Part #CLA
L8	RF Choke	.5Ω			19-1000		4602	1 Microhenry, IRC Part #CLA
L9	AM LoopStick	.1Ω	.4Ω	GL28827				
L10	AM RF Coil	70Ω	4.4Ω	GT531174				
L11	RF Choke	.44Ω						.68 Microhenries, IRC part #CLA Note 3
L12	AM Osc. Coil	3.9Ω		GL24610				Tapped @ .4Ω
L13	1st FM IF	.8Ω	.8Ω	GT24606	16-3487	FM-254	1463	
L14	1st AM IF	9Ω	9Ω	GT24609	16-6758	BC-352	12-C1	
L15	2nd FM IF	.8Ω	.8Ω	GT24606	16-3487	FM-254	1463	
L16	2nd AM IF	9Ω	9Ω	GT24609	16-6758	BC-352	12-C1	
L17	3rd FM IF	.8Ω	.8Ω	GT24606	16-3487	FM-254	1463	
L18	3rd AM IF	9Ω	9Ω	GT24609	16-6758	BC-353	12-C2	
L19	FM Limiter	.8Ω	.8Ω	GT24606	16-3487	FM-254	1463	
L20	Discriminator	.8Ω	10CT	GT481423	17-3494	FM-253	1464	

Note 1: Some versions may use 1 Microhenry choke in some applications.
Note 2: Some versions may use 3 Microhenries choke in some applications.
Note 3. Not used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M1	Dial Light		#47
M2	Dial Light		#47
M3	Tuning Cap.	JV531175	6 Gang (AM Sections: 10-555MMF, 10-555MMF, 10-200MMF)
M4A	Switch	ER481199	Selector (Rotary, Wafer Type)
B	Switch		On-Off (Power) SPST
M5	Meter	Z481200	Tuning
	Cage	C28803	
	Knob	P20778	Control (2 used)
	Dial Glass	P481092	
	Dial Pointer	Z24773	

PROPERTY OF



MOTOROLA
MODEL 6TAS8

TRADE NAME	Motorola Model 6TAS8
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Universal Type AM Superheterodyne Automobile Receiver
TUBES	Eight Plus Transistorized Audio Output Stage
POWER SUPPLY	12 Volt Storage Battery — RATING 2.6 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

* Connect DC probe thru 100Meg resistor to pin 7 (plate) of 12AE6 (Trigger); low side to chassis. Increase signal generator approximately ten (10) times.

** Not necessary unless tuner has been tampered with or components have been replaced. If necessary, back tuning cores out of coils. (Remove dial scale assembly to expose core adjustments.)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12AD6 (V2). Low side to chassis.	262.5KC (400∿ Mod)	High frequency end stop.	Across voice coil.	A2, A3, A4	Adjust for maximum output.
2.	"	"	"	"	*	A1	Adjust for MINIMUM deflection.
3.	Fig. 1	Thru dummy to ant. receptacle.	1610KC	"	Across voice coil.	A5, A6 A7	Adjust for maximum output.
**4.	"	"	1020KC	Set tuner carriage 9/16" from high freq. end stop.	"	A8, A9, A10	"
**5.	"	"	1610KC	High frequency end stop.	"	A5, A6, A7	Adjust for maximum output. Repeat steps 4 and 5.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC, adjust A7 for maximum volume.						

POINTER CALIBRATION OR REPLACEMENT

Set tuner to high frequency end stop. Set pointer to line up with right edge of the "6" ("160") on dial scale. Crimp & cement.

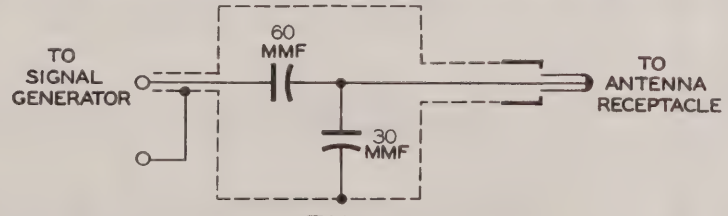


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AC6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12AC6	
V4	2nd IF Amplifier	12AC6	
V5	Det-AVC-AF Amp.	12CR6	
V6	Driver	12K5	
V7	Trigger	12AE6	
V8	Relay	12K5	
X1	Output Transistor	2N176	Note 1

Note 1: Transistor type 2N178 or 2N74 may be used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲100	16	23B536733	AFH3-02-10					R2299*
B	■500	16							
C2	200	3	23A537548	PRS6V250	BRH6025		TD-250-6	MTH-0625	TVA-1102

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

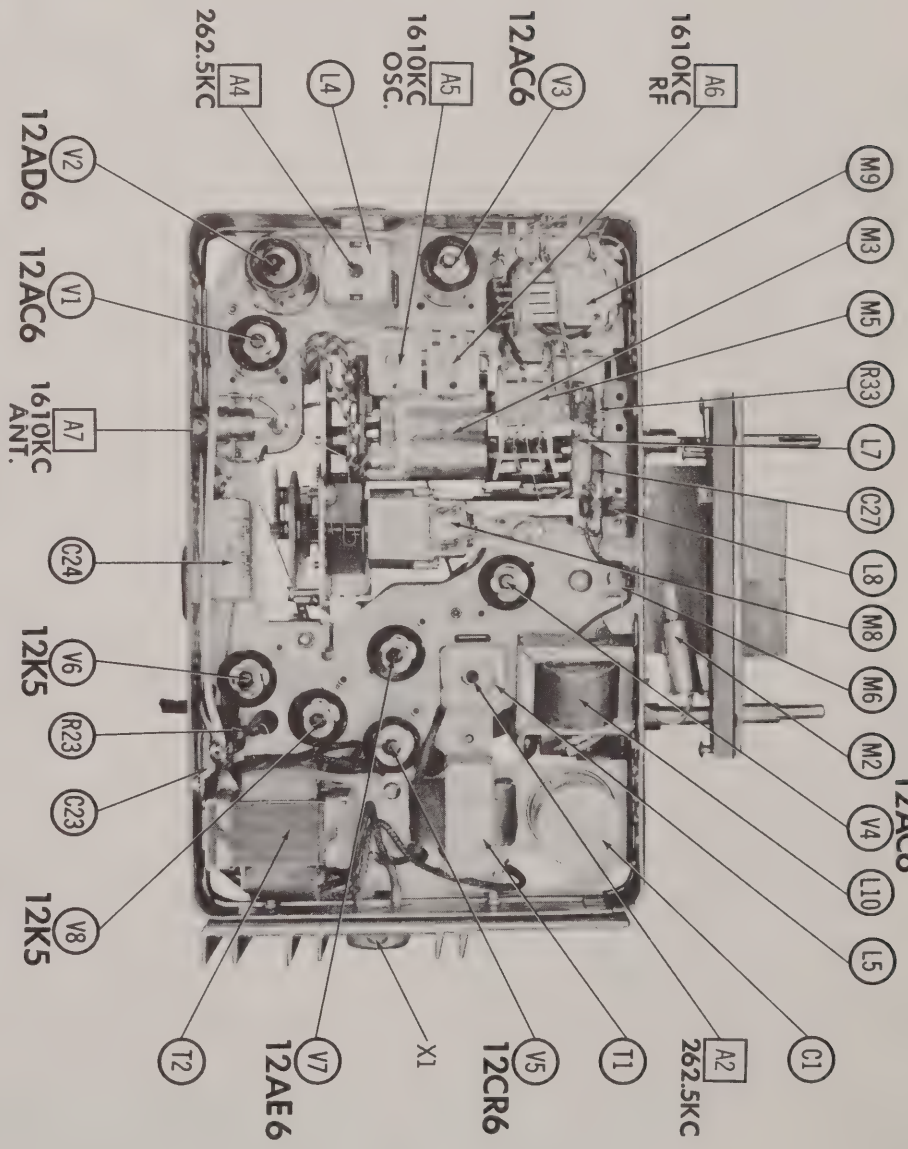
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	6.8		21R120546	NP0-SI6.8	TCZ-6R8	TZ08	NP0A-6R8	ZT-5568	5TCCB-V68	
C4	.01	200	8K124119	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C5	27		21R120567		TCN-27	TN08	N750K-270			
C6	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C7	220		21R115854	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C8	47		21R115593	N750-SI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C9	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C10	10000		21R121946	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C11	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C12	220		21K122420	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C13	100		21R400537	N750-D1100	TCN-100	N042	N750L-101	NT-531	5TCU-T1	
C14	100		21R400537	N750-D1100	TCN-100	N042	N750L-101	NT-531	5TCU-T1	
C15	.01	200	8R121868	BPD-001	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C16	.004	600	8R121000	BPD-004	D6-402	CUB6D4	GP2-333-402	PT624	6TM-D4	
C17	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C18	.01	200	8R121868	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C19	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C20	.1	200	8R121573	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C21	.05	200	8R121005	BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C22	1000		21R410127	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C23A	300		21A5222033							
B	300									
C24	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C25	10000		21R121946	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C26	10000		21R121946	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C27	470			BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	1/2	18B537862	F1-51	RTV-591C	♦{	UF16L	Tone (Panel)
B	1Meg			R2-56			UR16-T35	Volume (Rear) Tap@500K
C	Switch			KB-4			US-26	Attach to R1A
R2	500Ω	2	18K537172					Emitter Bias-200Ω stop (Wire-wound)

♦ Concentrikit Equivalent: K-6 Kit, Base Elements and Shafts: B11-139 , P13-133 (Panel) B13-133, R1-126 (Rear)

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R3	1000Ω		6R6229	BTS-1000	Note 1
R4	150Ω		6R6373	BTS-150	Note 2
R5	220K		6R6015	BTS-220K	
R6	1500Ω		6R6038	BTS-1500	
R7	4700Ω		6R6080	BTS-4700	
R8	1.5Meg		6R3966	BTS-1.5Meg	
R9	100K		6R6075	BTS-100K	
R10	47K		6R6048	BTS-47K	
R11	18K		6R5591	BTS-18K	
R12	680Ω		6R6040	BTS-680	
R13	82Ω		6R2035	BTS-82	
R14	220K		6R6407	BTS-220K	
R15	2.7Meg		6R488136	BTS-2.7Meg	Note 3
R16	22Meg		6R488158	BTS-22Meg	Note 4
R17	22K		6R6397	BTS-22K	
R18	100K		6R6075	BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R19	3.3Meg		6R2118	BTS-3.3Meg	
R20	120K		6R5631	BTS-120K	
R21	10K		6R6054	BTS-10K	
R22	270K		6R6414	BTS-270K	
R23	2.2Meg		6R3927	BTS-2.2Meg	
R24	56Ω		6R5614	BTS-56	
R25	10Ω		6R5621	BTS-10	
R26	27Ω		6R5683	BTS-27	
R27	3.9Meg		6R490110	BTS-3.9Meg	
R28	5.6Meg		6R3988	BTS-5.6Meg	
R29	3.3Meg		6R6497	BTS-3.3Meg	
R30	1Meg		6R6046	BTS-1Meg	
R31	5.6Meg		6R3988	BTS-5.6Meg	
R32	15Ω		6R2034	BTS-15	
R33	330Ω		6R6010	BTS-330	

Note 1: Some versions use 1800Ω in this application. (part #6R2089)
Note 2: Some versions use 470Ω in this application. (part #6R6090)
Note 3: Some versions use 5.6Meg in this application. (part #6R3988)
Note 4: Some versions use 8.2Meg in this application. (part #6R5585)

TRANSFORMER (DRIVER)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	67Ω	1.36Ω	25K537549						
	Turns Ratio								
	8.7 : 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	22Ω	3-4Ω	25K537550						

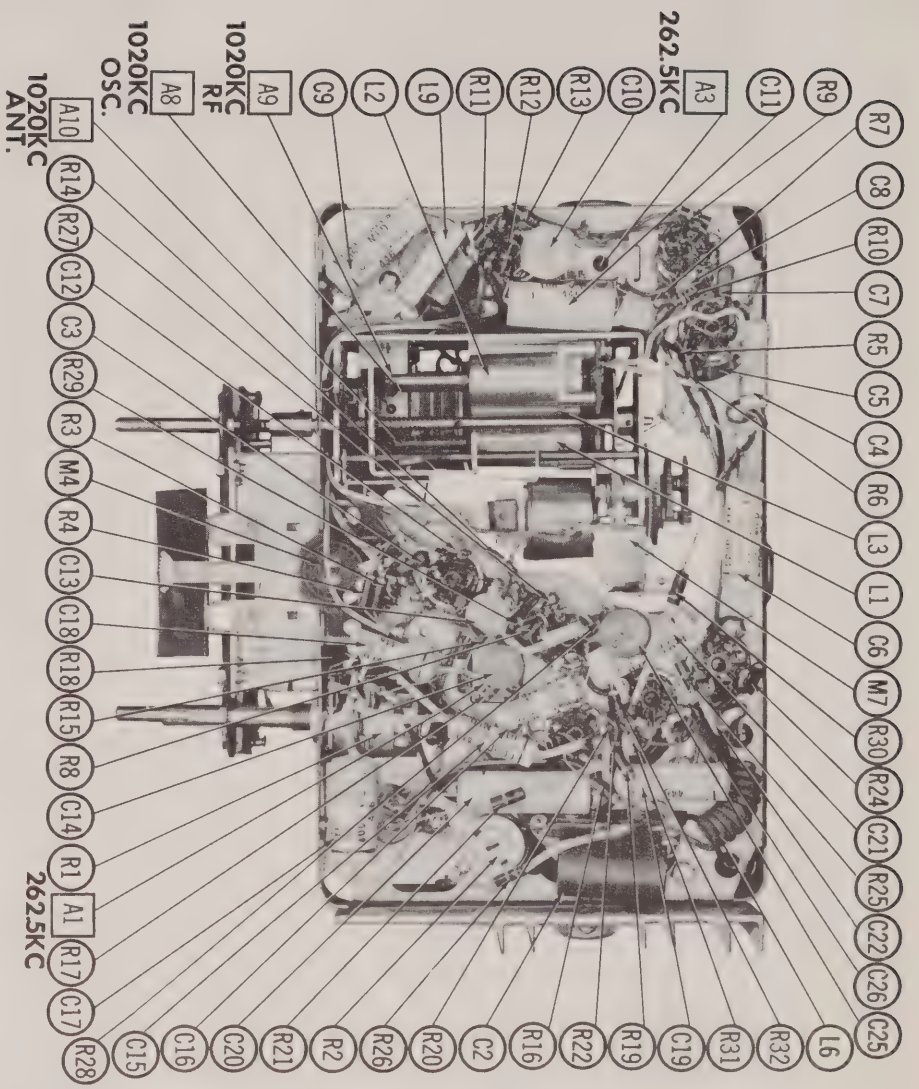
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6" X 9"	PM	3-4Ω	50K537864	69A2	238S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	8.5Ω		24B537932				
L2	RF Coil	8.5Ω		24B537932				
L3	Osc. Coil	1.1Ω	5.3Ω	24B537931				
L4	Input IF	57Ω	57Ω	24K537792	16-6752	BC-350	12-H1	
L5	Output IF	32Ω	32Ω	24B533073				
L6	Fil. Choke	0Ω		24K537544				
L7	Search Motor Hash Choke	.77Ω		24K537545				1.8 Microhenry, IRC Part #CL-1.
L8	Search Motor Hash Choke	.77Ω		24K537545				1.8 Microhenry, IRC Part #CL-1.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L9	.017A	41Ω	640MH	25B538791					
L10	.580A	.56Ω	10.6MH	25B537543					

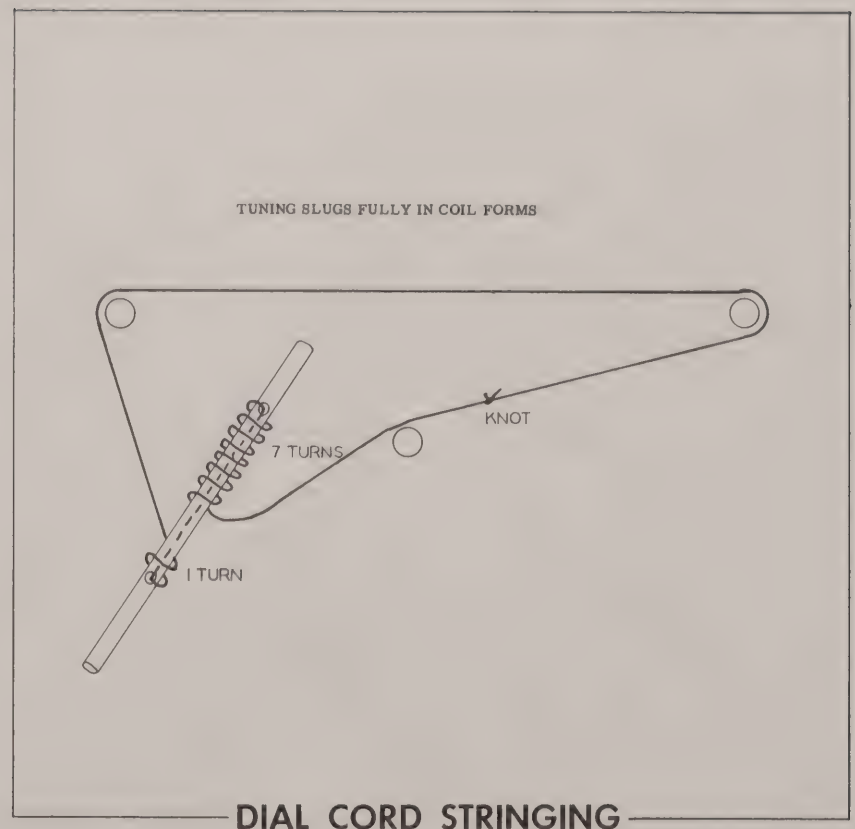
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	1AG	5A	65R122345	1V538874	301005, (1AG-5A)	155004*	AGA5	HRF

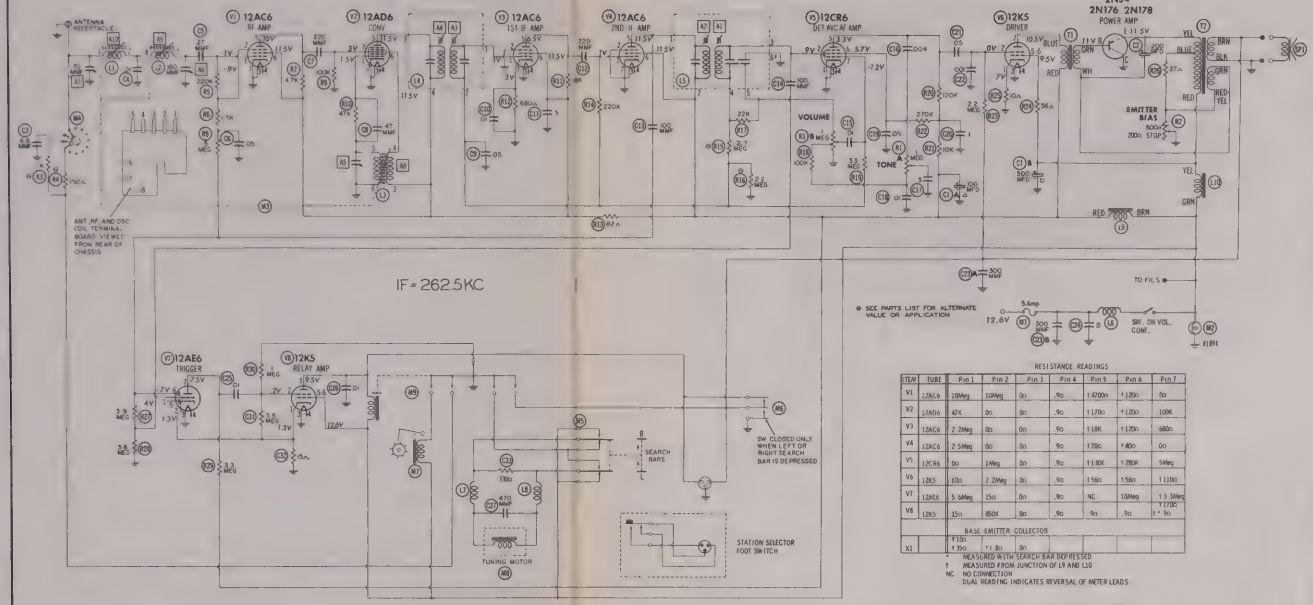
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Dial Light	65T533821	#1891
M3	Tuner	77D537920	(MST-181) Permeability, Includes L1, L2, L3.
M4	Switch	40B537454	Sensitivity (SP-3 Position; Rotary, Wafer Type)
M5	Switch	40K537765	Motor Reversing
M6	Switch	40A537219	Search (Used in Earlier Production Sets) See Note 1.
M7	Solenoid	59A537563	
M8	Motor	59K537096	Tuner Drive
M9	Relay	80B537171	
A5	Trimmer Cap.	20A485708	Osc. (395-470MMF)
A6	Trimmer Cap.	20A77536	RF. (50-280MMF)
A7	Trimmer Cap.	20A513232	Ant. (20-180MMF)
	Knob	36K536570	Tone
	Knob	36B536499	On-Off-Volume & Tuning
	Knob	36B536569	Dummy
	Push Button	38B537251	Search Bar (2 Used)
	Dial Pointer	1K532594	
	Dial Scale	34B537987	
	Arm	1V537629	Search Actuating (Includes Lefthand Pushbutton)
	Arm	1V537630	Search Actuating (Includes Righthand Pushbutton)
	Arm	45A537238	Switch (Riveted to Chassis)

Note 1: In later production sets M6 was changed to single leaf type switch (part #40A539643).



DIAL CORD STRINGING


ANTENNA RECEPTACLE
V1 12AC6 RF AMP
V2 12AD6 CONV
V3 12AC6 1ST IF AMP
V4 12AC6 2ND IF AMP
V5 12CR6 DET. REC. AF AMP
V6 12K5 DRIVER
2NJ4 2N176 2N178 POWER AMP
VOLUME
TONE
EMITTER BIAS
ANT. RF AND OSC COIL TERMINAL BOARD VIEWED FROM REAR OF CHASSIS
IF = 262.5KC
V7 12AE6 TRIGGER
V8 12K5 RELAY AMP
SEARCH BARS
SW. CLOSED ONLY WHEN LEFT OR RIGHT SEARCH BAR IS DEPRESSED
TUNING MOTOR
STATION SELECTOR FOOT SWITCH
TO F.I.L.S.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
12.6V
SW. ON VOL. CONT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AC6	10Meg	10Meg	0Ω	9Ω	†4700Ω	†120Ω	0Ω
V2	12AD6	47K	0Ω	0Ω	9Ω	†170Ω	†120Ω	100K
V3	12AC6	2.2Meg	0Ω	0Ω	9Ω	†18K	†170Ω	680Ω
V4	12AC6	2.5Meg	0Ω	0Ω	9Ω	†78Ω	†40Ω	0Ω
V5	12CR6	0Ω	1Meg	0Ω	9Ω	†130K	†280K	5Meg
V6	12K5	10Ω	2.2Meg	0Ω	9Ω	†56Ω	†56Ω	†110Ω
V7	12AE6	5.6Meg	15Ω	0Ω	9Ω	NC	10Meg	1.3Meg
V8	12K5	15Ω	850K	0Ω	9Ω	9Ω	9Ω	†170Ω †90Ω
		BASE	EMITTER	COLLECTOR				
X1		†15Ω †35Ω		†1.8Ω	0Ω			

* MEASURED WITH SEARCH BAR DEPRESSED
† MEASURED FROM JUNCTION OF L9 AND L10
NC NO CONNECTION
DUAL READING INDICATES REVERSAL OF METER LEADS

1 DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2 Socket connections are shown as bottom views.
3 Measured values are from socket pin to common negative.
4 Battery voltage maintained at 13.8 volts for voltage readings.
5 Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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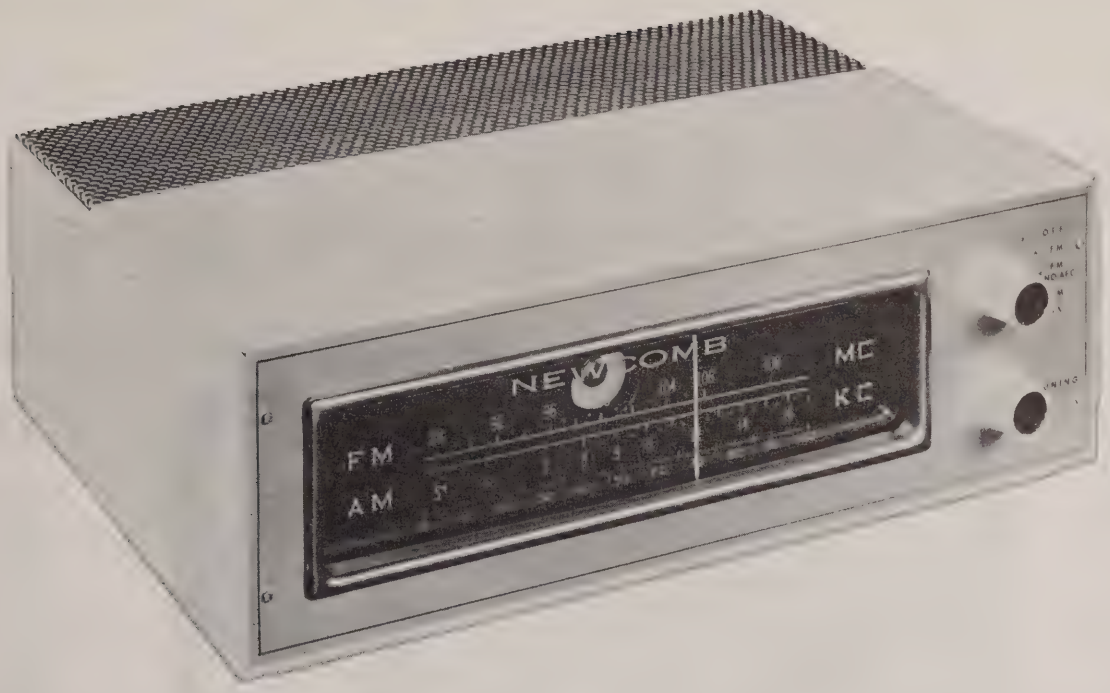
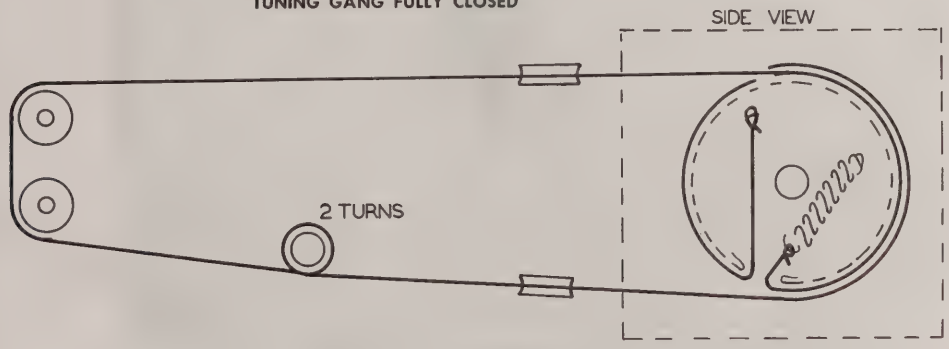


NEWCOMB
MODEL CO-200

TRADE NAME	Newcomb Model CO-200		
MANUFACTURER	Newcomb Audio Prod. Co., 6824 Lexington Ave., Hollywood 38, Calif.		
TYPE SET	AC Operated FM-AM Superheterodyne Tuner		
TUBES	Ten		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING	.32 Amp. @ 117 Volts AC
TUNING RANGE--BROADCAST	530KC - 1700KC	FM	88MC - 108MC

NEWCOMB
MODEL CO-200

TUNING GANG FULLY CLOSED



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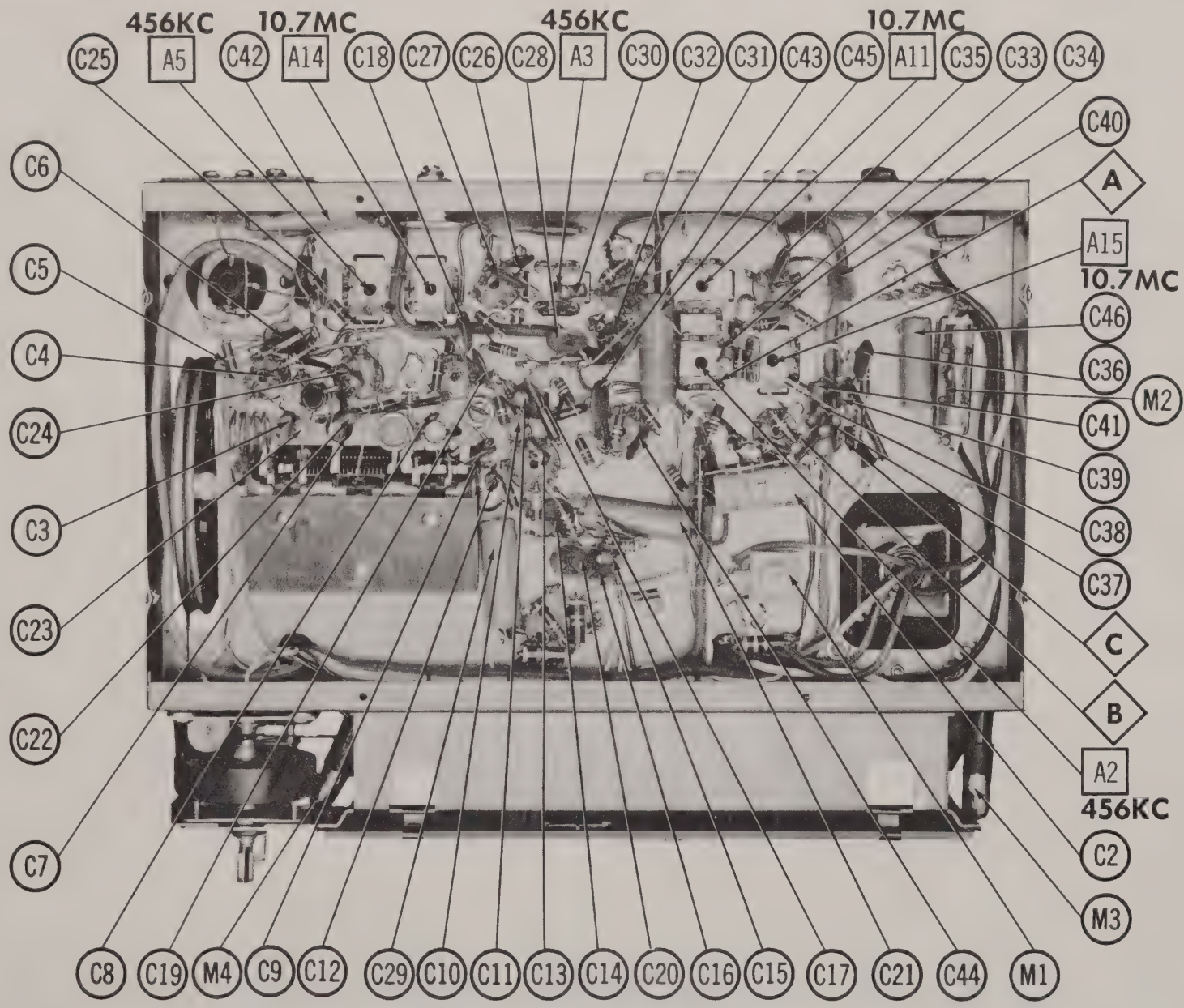
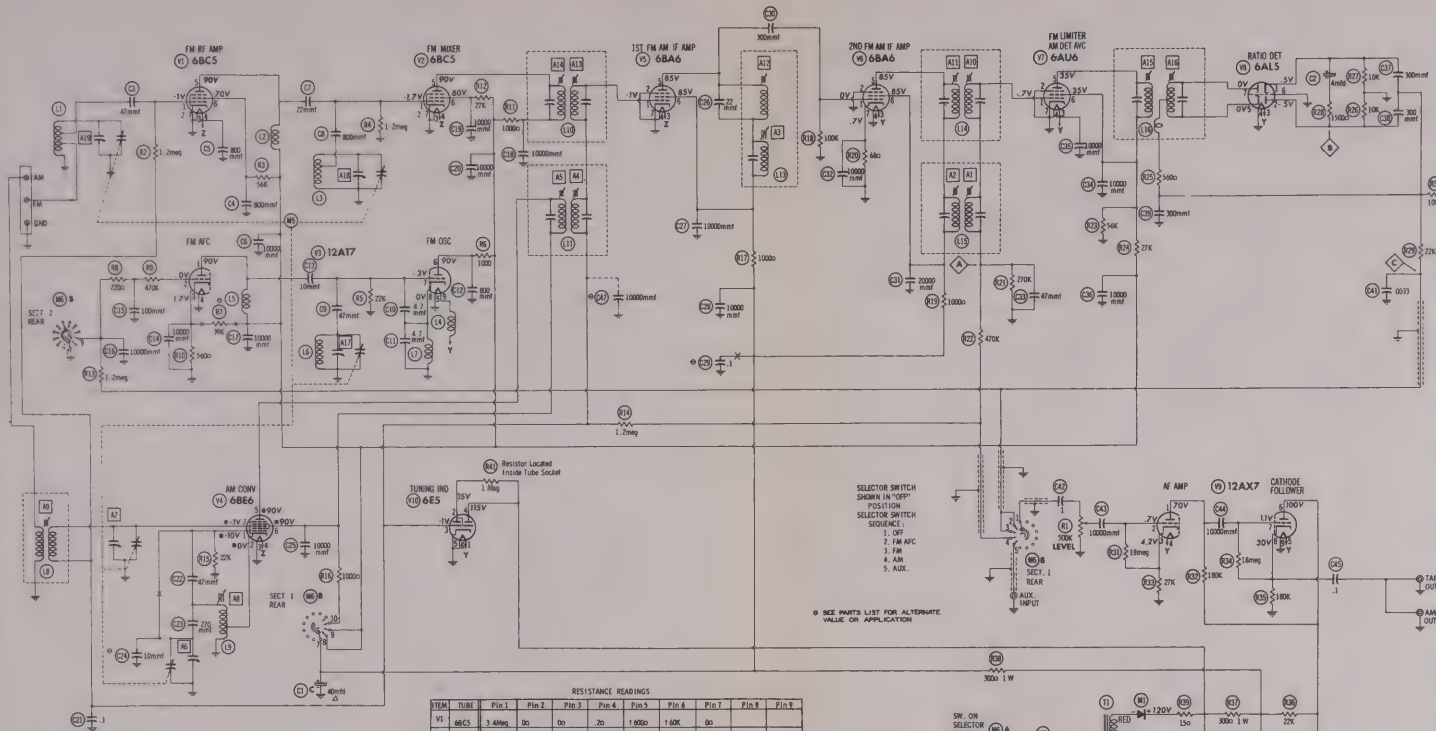


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC5	3.4Meg	0Ω	0Ω	.2Ω	↑600Ω	↑60K	0Ω		
V2	6BC5	1.2Meg	0Ω	0Ω	.2Ω	↑1600Ω	↑28K	0Ω		
V3	12AT7	↑600Ω	470K	560Ω	0Ω	0Ω	↑1600Ω	22K	.3Ω	.3Ω
V4	6BE6	22K	.7Ω	0Ω	.2Ω	▪↑1600Ω	▪↑1600Ω	▪2.2Meg		
V5	6BA6	2.2Meg	0Ω	.2Ω	0Ω	↑1600Ω	↑1600Ω	0Ω		
V6	6BA6	100K	0Ω	.2Ω	0Ω	↑1600Ω	↑1600Ω	68Ω		
V7	6AU6	270K	0Ω	.1Ω	0Ω	↑28K	↑28K	0Ω		
V8	6AL5	10K	10K	.1Ω	0Ω	1.2meg	0Ω	1.2meg		
V9	12AX7	↑700K	1.8Meg	27K	.1Ω	.1Ω	↑22K	1.8Meg	180K	0Ω
V10	6E5	.2Ω	↑1Meg	2.2Meg	↑150Ω	0Ω	0Ω			

ALL MEASUREMENTS TAKEN IN FM UNLESS OTHERWISE DESIGNATED.
↑ MEASURED FROM OUTPUT OF ANT.
▪ MEASURED IN AM POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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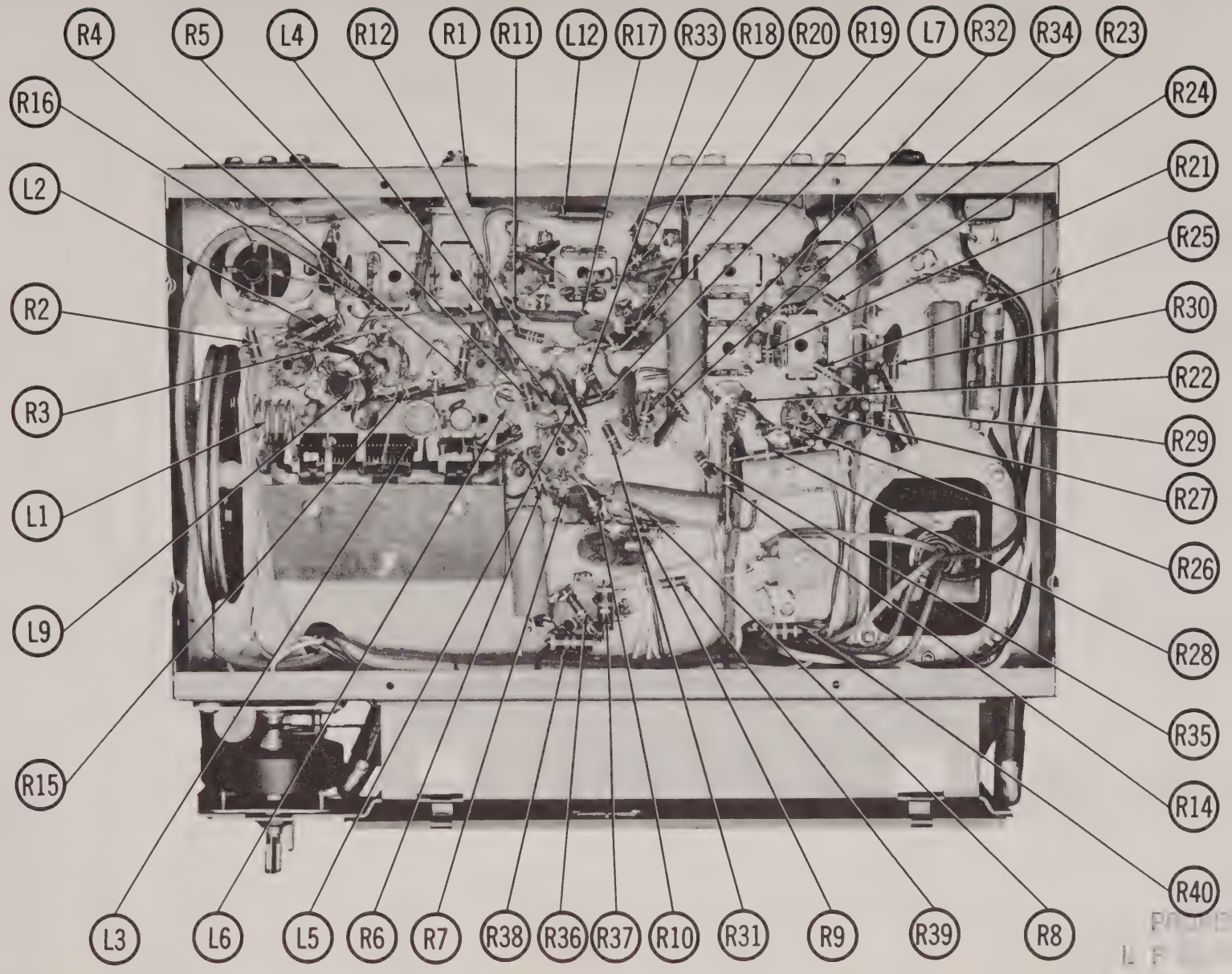


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L F [illegible] HIP
[illegible] ST.
[illegible]

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed, pointer should coincide with "O" on logging scale.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis.	456KC (400∿ Mod)	AM	Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	200MMF	High side to AM antenna terminal.	1500KC	"	1500KC	"	A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

AFC to "No AFC" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6BC5 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference.	DC probe to point (A). Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	"	"	"	DC probe to point (B). Common to chassis.	A15	"
6.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC Sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
AFC to "No AFC" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (grid) of 6BC5 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A15	"
6.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A16	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A15 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

AFC to "No AFC" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe to point (B). Common to chassis.	A17, A18, A19	Adjust for maximum deflection.

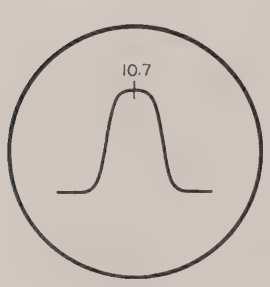


FIG. 1

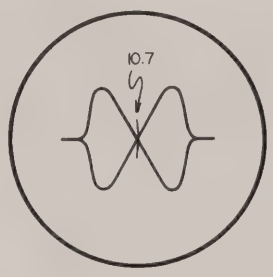


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BC5	
V2	FM Mixer	6BC5	
V3	FM Osc. - AFC	12AT7	
V4	AM Converter	6BE6	
V5	1st IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V6	2nd IF Amplifier	6BA6	
V7	Limiter-AM Det.	6AU6	
V8	Ratio Detector	6AL5	
V9	AF Amp. -Cathode Follower	12AX7	
V10	Tuning Indicator	6E5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA NEWCOMB PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬60	150	CE-40	AFH4-01	D001	FP311. 7		Q-005	R2291*
B	■40	150			BR2015	TC48		MT-1520	
C	▲40	150							
D	20	150							
C2	4	25	CE-41	SRE25V5	BBR4-50	TC30	TD-4-25	MMT-0505	TVA-1203

* Non catalog item.

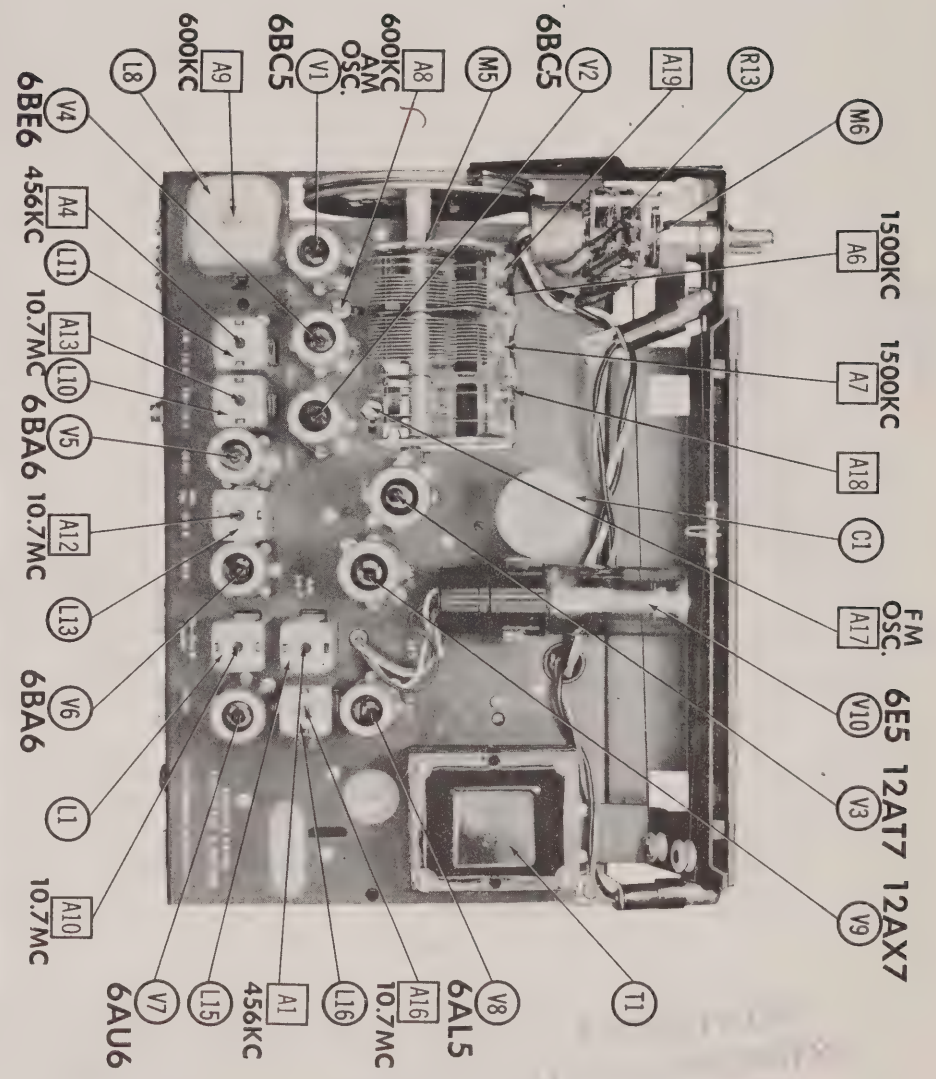
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA NEWCOMB PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	47		CM-3	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	800		CM-44	BPD-0008	DD-801	G067	831-801	UC-5375	5GA-T8	
C5	800		CM-44	BPD-0008	DD-801	G067	831-801	UC-5375	5GA-T8	
C6	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C7	22		CM-48	NP0-SI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C8	800		CM-44	BPD-0008	DD-801	G067	831-801	UC-5375	5GA-T8	
C9	47		CM-45	NP0-DI47	TCZ-47	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C10	4.7		CM-47	NP0-DI4. 7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C11	4.7		CM-47	NP0-DI4. 7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C12	800		CM-44	BPD-0008	DD-801	G067	831-801	UC-5375	5GA-T8	
C13	10		CM-51	N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	
C14	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C15	100		CM-14	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C16	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C17	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C18	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C19	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C20	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C21	.1	400	CP-51	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C22	47		CM-3	NP0-SI47	D6-470	Z033	NP0-338-470	ZT-5447	5TCC-Q47	
C23	270		CM-49	NP0-SI270	D6-271	5R5T27	811-271		MS-327	
C24	10		CM-51	N750-SI10	TCN-10	TN01	N750A-100	NT-541	5TCU-Q1	Note 1
C25	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C26	22		CM-48	NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C27	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C28	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C29	.1	400	CP-51	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	Note 1
C30	300		CM-15	SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	
C31	20000		CM-35	BPD-02	DD-203	K085	817-02	PT412	5HK-S2	
C32	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C33	47		CM-3	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C34	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C35	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C36	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C37	300		CM-15	1469-0003	D6-301	5R5T3	811-301	MCB241	MS-33	
C38	300		CM-15	1469-0003	D6-301	5R5T3	811-301	MCB241	MS-33	
C39	300		CM-15	1469-0003	D6-301	5R5T3	811-301	MCB241	MS-33	
C40	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C41	.0033	600	CP-69	DI-0033	D6-332	CUB6D33	801-0033	PT6233	6TM-D33	
C42	.1	400	CP-51	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C43	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C44	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C45	.1	400	CP-51	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C46	.022	600	CP47	BPD-02	DD-203	CUB6S22	817-02	PT6122	6TM-S22	
C47	10000		CM-32	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	

Note 1: Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NEWCOMB PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RV-55	AB-60	A47-500K-2	Q13-133	U-48	Level
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NEWCOMB PART No.	IRC PART No.	
R2	1.2Meg		RR-38	BTS-1.2Meg	
R3	56K		RR-25	BTS-56K	
R4	1.2Meg		RR-38	BTS-1.2Meg	
R5	22K		RR-21	BTS-22K	
R6	1000Ω		RR-6	BTS-1000	
R7	39K		RR-24	BTS-39K	Note 1
R8	220Ω		RR-2	BTS-220	
R9	470K		RR-33	BTS-470K	
R10	560Ω		RR-4	BTS-560	
R11	1000Ω		RR-6	BTS-1000	
R12	27K		RR-22	BTS-27K	
R13	1.2Meg		RR-38	BTS-1.2Meg	
R14	1.2Meg		RR-38	BTS-1.2Meg	
R15	22K		RR-21	BTS-22K	
R16	1000Ω		RR-6	BTS-1000	
R17	1000Ω		RR-6	BTS-1000	
R18	100K		RR-27	BTS-100K	
R19	1000Ω		RR-6	BTS-1000	
R20	68Ω		RR-174	BTS-68	
R21	270K		RR-31	BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NEWCOMB PART No.	IRC PART No.	
R22	470K		RR-33	BTS-470K	
R23	56K		RR-25	BTS-56K	
R24	27K		RR-22	BTS-27K	
R25	560Ω		RR-4	BTS-560	
R26	10K		RR-18	BTS-10K	
R27	10K		RR-18	BTS-10K	
R28	1500Ω		RR-8	BTS-1500	
R29	22K		RR-21	BTS-22K	
R30	100K		RR-27	BTS-100K	
R31	18Meg		RR-140	BTS-18Meg	
R32	180K		RR-29	BTS-180K	
R33	27K		RR-22	BTS-27K	
R34	18Meg		RR-140	BTS-18Meg	
R35	180K		RR-29	BTS-180K	
R36	22K		RR-21	BTS-22K	
R37	300Ω 5%	1	RR-177	BTA-300 5%	
R38	300Ω 5%	1	RR-177	BTA-300 5%	
R39	15Ω		RR-178	BTS-15	
R40	3.3Ω	1	RR-179	BW1-3.3	
R41	1Meg			BTS-1Meg	

Note 1: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .32A	118VAC @ .035A	6.3VAC @ 2.3A		TR-184	P9102 ①	P-3045 ①	PA-8421 ①		

① Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	NEWCOMB PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		RC-14				Tapped
L2	RF Choke	.3Ω		RC-6	19-1002		4606	2.2 Microhenries
L3	FM RF Coil	0Ω		RC-15				Tapped
L4	Fil. Choke	.3Ω		RC-6	19-1002		4606	2.2 Microhenries
L5	RF Choke	.3Ω		RC-6	19-1002		4606	2.2 Microhenries
L6	FM Osc. Coil	0Ω		RC-16				
L7	Cathode Choke	.7Ω		RC-20	19-1001		4604	1.5 Microhenries
L8	AM Ant. Coil	58Ω	3Ω	RC-12				
L9	AM Osc. Coil	6.7Ω		RC-26				Tapped @ .7Ω
L10	1st FM IF	.6Ω	.6Ω	RC-10	16-3487	FM-254	1463	
L11	1st AM IF	10.5Ω	10.5Ω	RC-24	16-6758	BC-352	12-C1	
L12	Fil. Choke	.1Ω		RC-21				2 Microhenries
L13A	2nd FM IF	1Ω		RC-9				
B	2nd AM IF	9Ω						
L14	3rd FM IF	.6Ω	.6Ω	RC-10	16-3487	FM-254	1463	
L15	3rd AM IF	10.5Ω	10.5Ω	RC-24	16-6758	BC-353	12-C2	
L16	Ratio Det.	1.4Ω	1.1ΩCT	RC-23	17-3498	FM-255	1465	Tertiary winding = .8Ω

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	NEWCOMB PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.035A		1386	RS065Q	6S65	8J1	65	

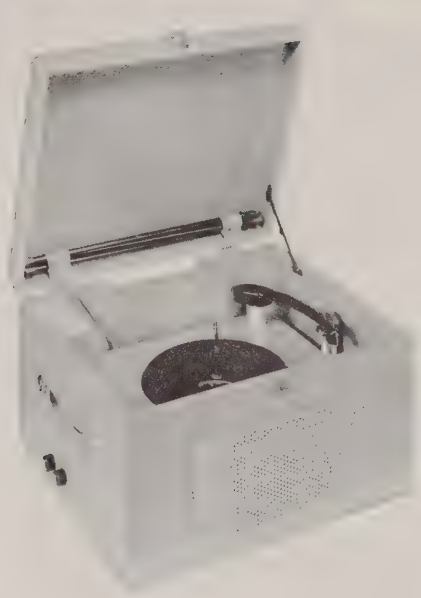
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			NEWCOMB PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	1/2A 250V	FA-20		313.500 (3AG-S/B-½A)	357001	MDL½	4405

MISCELLANEOUS

ITEM No.	PART NAME	NEWCOMB PART No.	NOTES
M3	Dial Light		#47
M4	Dial Light		#47
M5	Tuning Cap.	CV-5	5 Gang (AM Sections: 22-385MMF, 15-240MMF)
M6A	Switch	SY-92	On-Off (Power) SPST
B	Switch		Selector (4 Pole-5 Position; Rotary, Wafer Type)

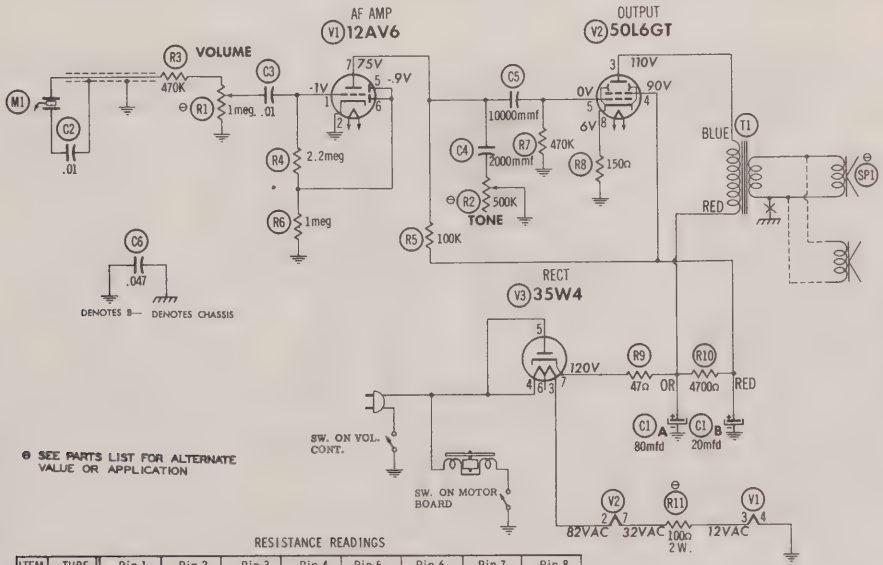
PHILCO MODELS
D-1337, D-1339, D-1344, D-1346



PHILCO MODELS
D-1337, D-1339, D-1344, D-1346

TRADE NAME	Philco Models D-1337, D-1339, D-1344, D-1346
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .24 Amp. @ 117 Volts AC

RECORD CHANGER - PHILCO MODEL M-26. EARLY VERSIONS OF MODEL D-1337 USE RECORD CHANGER MODEL M-24A.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12AV6	3.2Meg	0Ω	12Ω	0Ω	1Meg	1Meg	†105K	
V2	50L6	NC	162Ω	†280Ω	†4700Ω	470K	TP	112Ω	150Ω
V3	35W4	TP	TP	162Ω	200Ω	200Ω	NC	6000Ω	

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50L6GT	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	30-2417-47	PRS150V40 4020	BBRT44215	TCT3107	TDLD-10	FMT-315	TVA-2460
B	25	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.01	400	30-4650-58	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C3	.01	400	30-4650-41	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C4	2000		30-1238-8	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C5	10000		30-1238-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	33-5566-68	B-70-S	A47-1Meg-Z	Q13-137	U-53	Volume - Note 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A
R2A	500K	½	33-5565-81	B-60	A47-500K-Z	Q13-133	U-48	Tone (Note 2)
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

Note 1. Model D-1337 will use an alternate control part #33-5565-97.
Note 2. Model D-1337 will use an alternate control part #33-5565-96.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R3	470K		66-4478340	BTS-470K	
R4	2.2Meg		66-5228340	BTS-2.2Meg	
R5	100K		66-4108340	BTS-100K	
R6	1Meg		66-5108340	BTS-1Meg	
R7	470K		66-4478340	BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R8	150Ω		66-1158340	BTS-150	
R9	47Ω	1	66-0474340	BTA-47	
R10	4700Ω		66-2478340	BTS-4700	
R11	100Ω	2	33-1343-3		Note 1

Note 1. Early production models use a temperature compensating resistor in this application, 880Ω cold, 100Ω hot. (Part #33-1343-3).

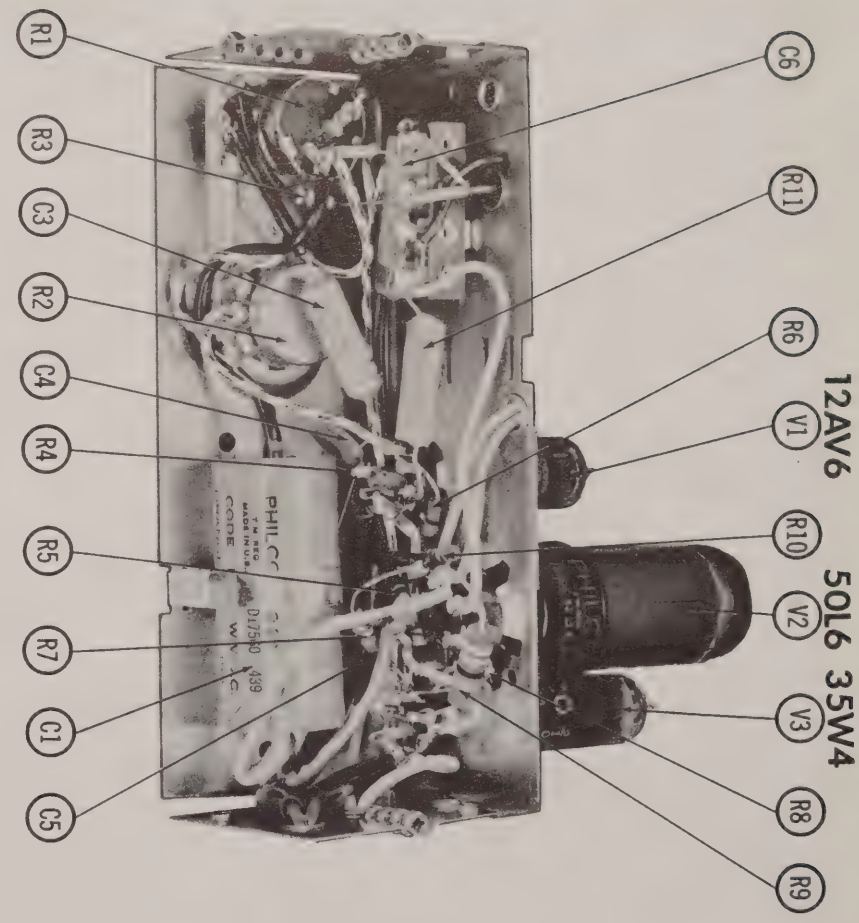
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.7KΩ	3-4Ω	322-0054	Z1101 ①	A-3025①	A-3332①	26S58 ①	S-12X ①	① Bend ears down to fit bracket.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"	PM	3-4Ω	36-1654-5①	4A1	304S2	① Used in Models D-1337, D-1339
	4"	PM		45-9727 ②	4A1	304S2	② Used in Model D-1344 (2 used)
	6"	PM		45-9735 ③	6A1	12S6I	③ Used in Model D-1346 (2 used)

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PHILCO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	425-0011					

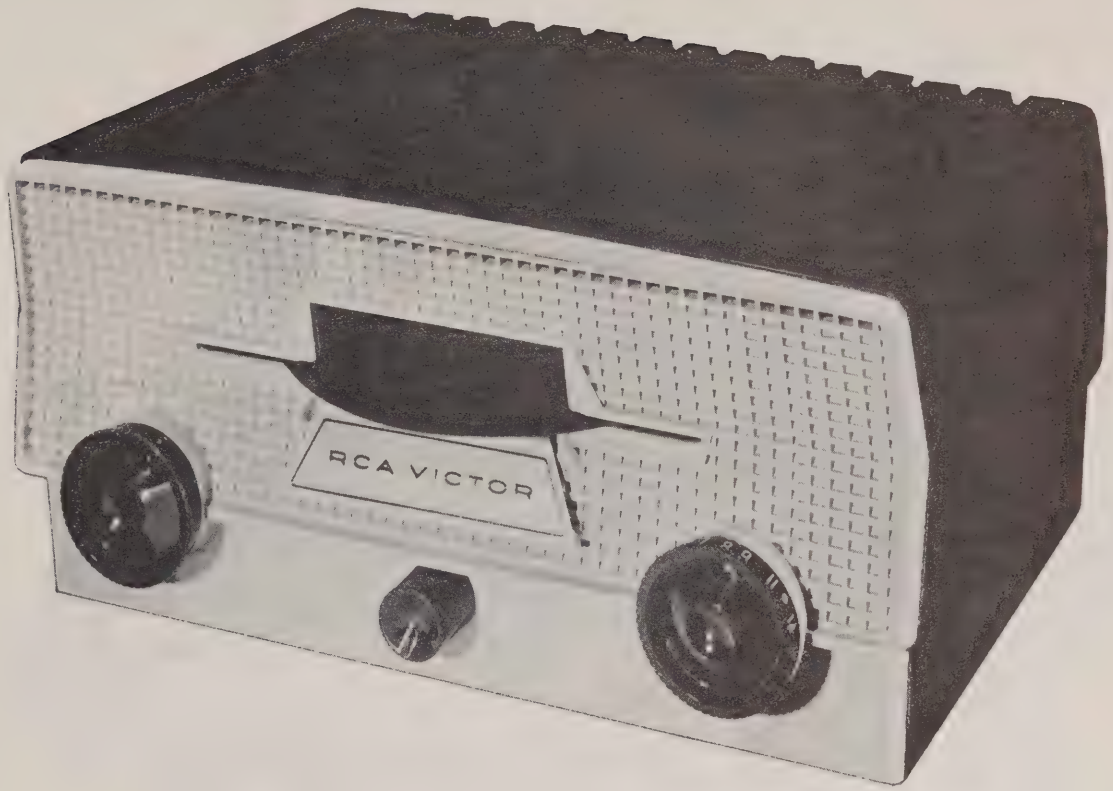
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA PHILCO PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	45-9784	†AC-148 or ♦†AC-148D1 or †♦AC-148D2 or ♦AC-148D	*PH-12 or †PH-13 or ♦†PH-13SD or ♦PH-13D	†W-46TPS or ♦†W-46DS or ♦W-46TPD	* Metal † Jewel ♦ Diamond

RCA VICTOR MODELS 6-XY-5A, B (Ch. RC-1152)

RCA VICTOR MODELS 6-XY-5A, B (Ch. RC-1152)



RCA VICTOR MODELS 6-XY-5A, B (Ch. RC-1152)

TRADE NAME	RCA Victor Models 6-XY-5A, 6-XY-5B (Ch. RC-1152)
MANUFACTURER	RCA Victor Radio & Victrola Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
TUNING RANGE—BROADCAST	540-1600KC
RATING	.25 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400~ Mod.)	Point of non-interference.	Across voice coil.	A1	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	"	"	"	A2, A3	"
3.		Loop	1620KC	Tuning gang fully open.	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	Tune to 1400KC signal.	"	A5	"
5.		"	600KC	Tune to 600KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE RCA VICTOR MODEL RP-199-PHOTOFACT SET 289 - FOLDER 8 OR RECORD CHANGER MANUAL CM-7.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 8-XY-5A (Ch. RC-1152)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA VICTOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	76718	PRS150V3050	BBRD5315	TCD497	TDLD-8	MTD-301	TVA-2450
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400	73533	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C3	68		39624	NP0-S168	TCZ-68	Z038	NP0-337-680		5TCC-Q68	
C4	.047	400	73533	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C5	82		101836	1469-000082	D6-820	TZ28	NP0-337-820		MS-482	
C6A	220									
B	5000									
C	5000		†79058	†PA-113-2	†PC-151	†116TM2	†1408-02		†DT-2	
D	250									
E										
C7	.018	400	100115							
C8	.047	400	75071	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C9	.047	400	73553	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

† Items C6A, C6B, C6C, C6D, C6E, R8A, R8B and R8C are combined in one unit. When replacing items separately, C6D and C6E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA VICTOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	101550	AB-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

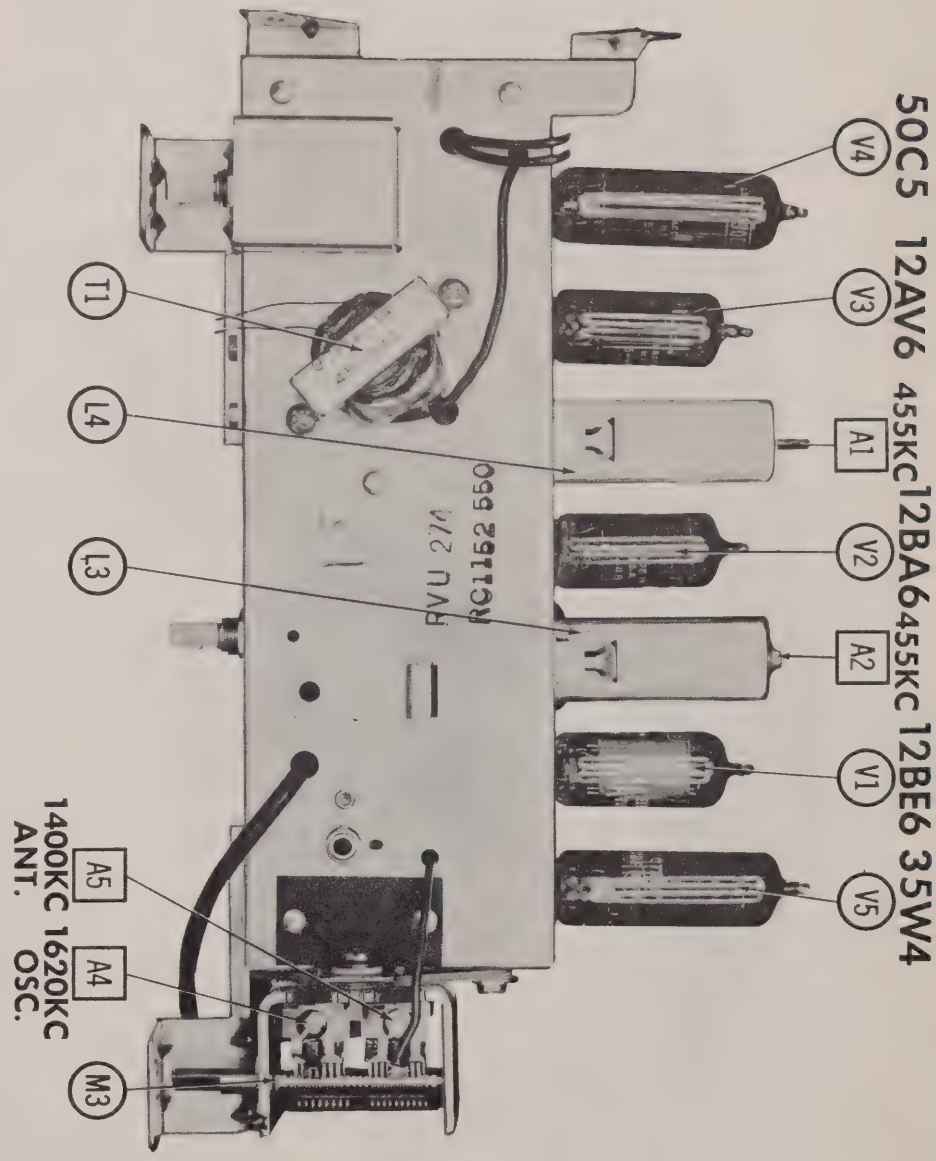
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	
R2	22K		502322	BTS-22K	
R3	100Ω		502110	BTS-100	
R4	100Ω		502110	BTS-100	
R5	3.3Meg		502533	BTS-3.3Meg	
R6	47K		502347	BTS-47K	
R7	470K		502447	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA VICTOR PART No.	IRC PART No.	
R8A	6.8Meg		†79058	BTS-6.8Meg	
B	470K			BTS-470K	
C	470K			BTS-470K	
R9	150Ω		502115	BTS-150	
R10	1200Ω	1	512212	BTA-1200	
R11	33Ω	1	512033	BTA-33	

† Items R8A, R8B, R8C, C6A, C6B, C6C, C6D and C6E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA VICTOR PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3-4Ω	77993	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA VICTOR PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	79696	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA VICTOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.4Ω		100086				
L2	Osc. Coil	.8Ω	7.5Ω	79285	14-1027		71-Osc.	
L3	Input IF	14Ω	14Ω	75486	16-6758	BC-351	12-C1	
L4	Output IF	26Ω	13Ω	77994				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA VICTOR PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	74067	408	N-10-LJ	44	0-1 or S-1	

ASTATIC AND ELECTRO VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

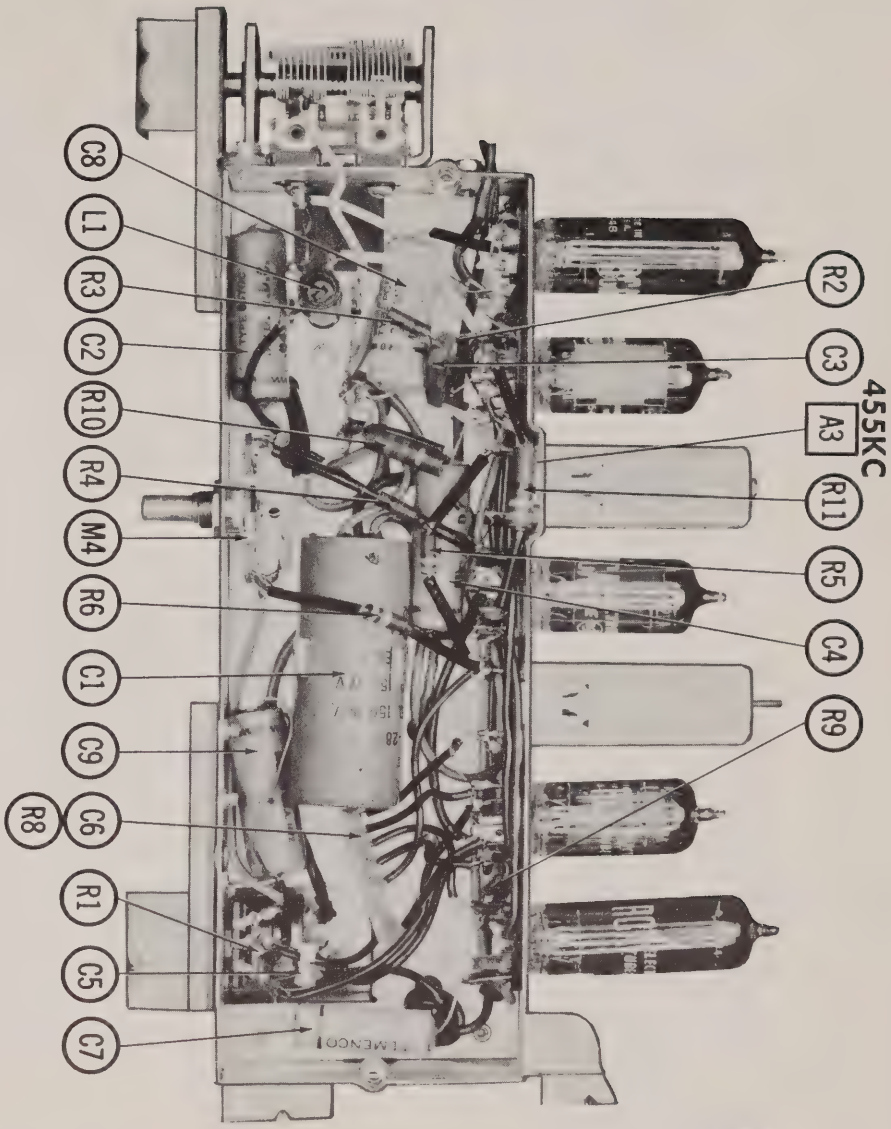
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	RCA VICTOR PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	74068	†A-97 or ♦A-97D	*M-71LP or †M-70LP or ♦M-70LPD	†W-42MGS or ♦W-42MGD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M3	Tuning Cap.	101551	2 Gang (13-265MMF, 14-105MMF)
M4	Switch	101553	Radio-Phono (DPDT Rotary, Wafer Type)
	Cabinet	Y2871	Model 6-XY-5A
	Cabinet	Y2872	Model 6-XY-5B
	Knob	101555	On-Off-Volume, Model 6-XY-5A
	Knob	101557	On-Off-Volume, Model 6-XY-5B
	Knob	101556	Tuning, Model 6-XY-5A
	Knob	101558	Tuning, Model 6-XY-5B
	Knob	101559	Radio-Phono Switch, Model 6-XY-5A
	Knob	101560	Radio-Phono Switch, Model 6-XY-5B

CHASSIS—BOTTOM VIEW



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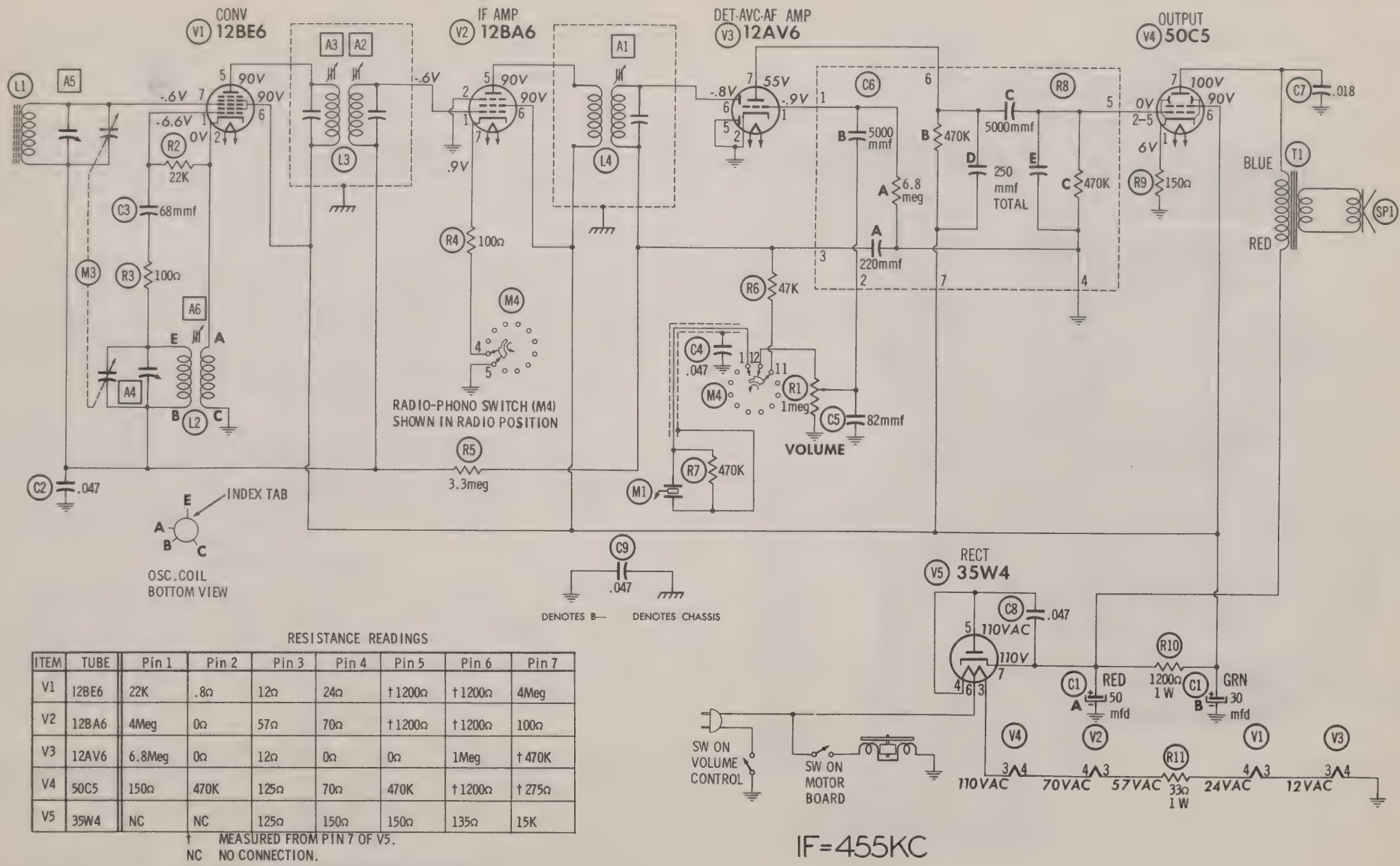
RCA VICTOR MODEL 6-XY-5A (Ch. RC-1152)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	12Ω	24Ω	†1200Ω	†1200Ω	4Meg
V2	12BA6	4Meg	0Ω	57Ω	70Ω	†1200Ω	†1200Ω	100Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	0Ω	1Meg	†470K
V4	50C5	150Ω	470K	125Ω	70Ω	470K	†1200Ω	†275Ω
V5	35W4	NC	NC	125Ω	150Ω	150Ω	135Ω	15K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.
ALL MEASUREMENTS TAKEN IN RADIO POSITION.

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SILVERTONE MODELS 6104, 6105 (Ch. 549.20030, 1, 2, 3, 4)

IMPORTANT FILING NOTICE

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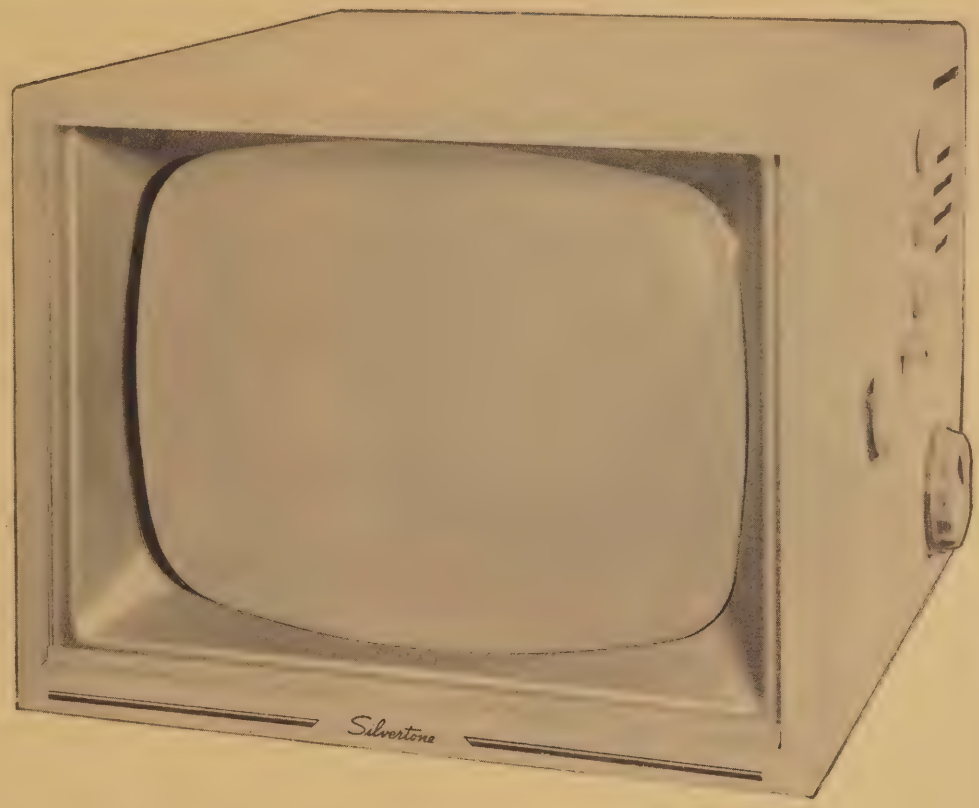

SILVERTONE MODEL 6104 (Ch. 549.20031)

TRADE NAME	MODELS	CHASSIS
	6104	549.20030, 549.20031, 549.20032, 549.20033, 549.20034
	6105	549.20032, 549.20033, 549.20034
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois	
TYPE SET	Television Receiver	
TUBES	Fourteen	
POWER SUPPLY	110-120 Volts AC-60 Cycle or DC	RATING 1.01 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

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SILVERTONE MODELS 6104, 6105 (Ch. 549.20030, 1, 2, 3, 4)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 5 wood screws and 1 metal screw. Remove rear cover.

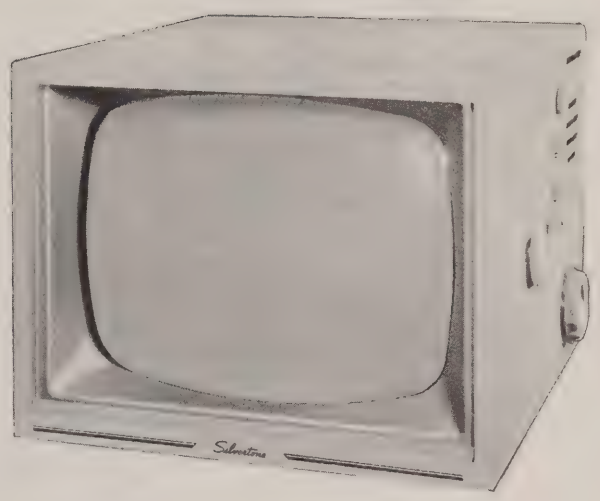
3. Remove 2 wood screws holding antenna - AC interlock bracket.

4. Remove picture tube socket, speaker leads and HV lead.

5. Remove ion trap and yoke springs and collar.

6. Remove 2 wing nuts. Remove speaker.

7. Remove 2 chassis bolts and 1 wood screw holding chassis at the top. Remove chassis.



MODEL	CHASSIS
6104	549.20031

SILVERTONE MODELS 6104, 6105
(Ch. 549.20030, 1, 2, 3, 4)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding plastic molding at bottom of safety glass. Remove molding and lift out glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control to its mid-range position and adjust the horizontal oscillator slug (L13) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, remove the rear cover and supply power to chassis. Adjust buzz control located on rear of chassis for maximum sound and minimum buzz.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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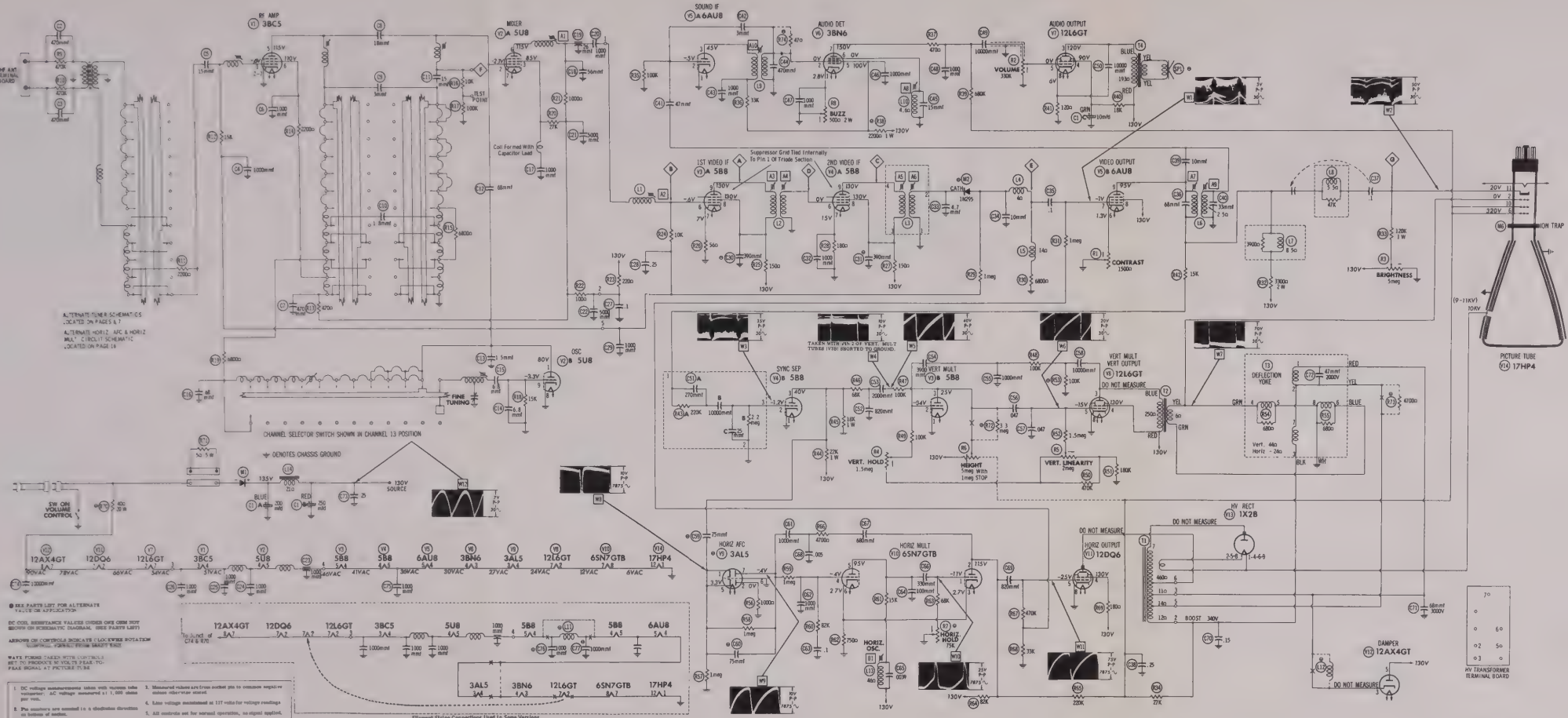
SILVERTONE MODELS 6104, 6105
(Ch. 549.20030, 1, 2, 3, 4)
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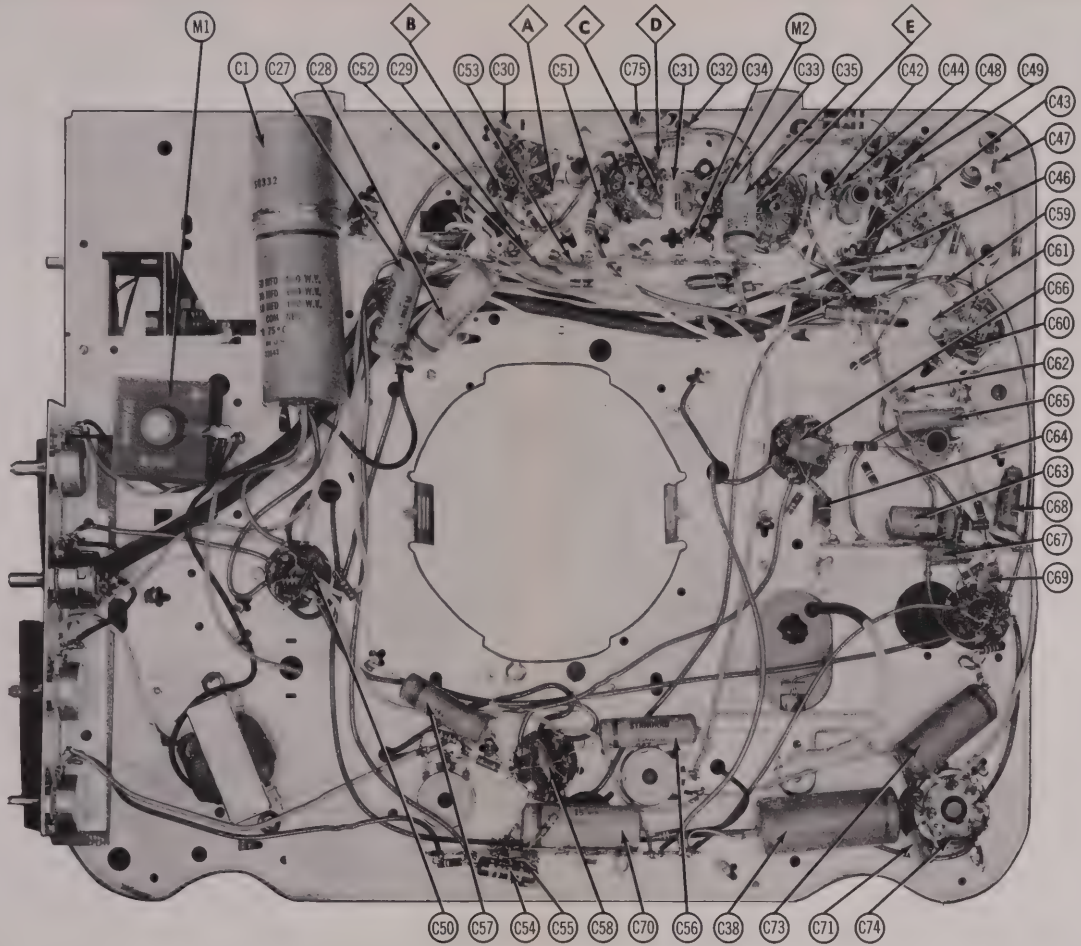
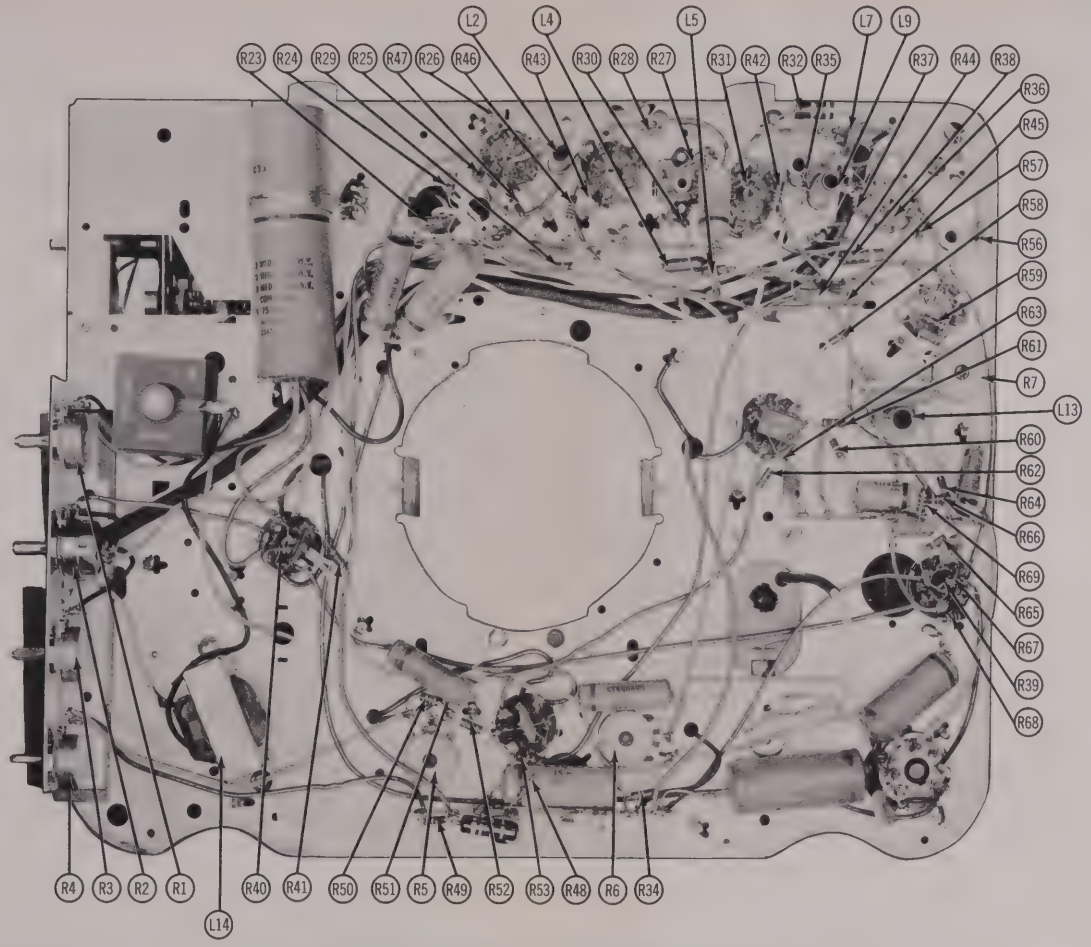
Filament String Connections Used In Some Versions.
DENOTES CHASSIS GROUND
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
PICTURE TUBE V14 17HP4
SILVERTONE MODELS 6104, 6105
(Ch. 549.20030, 1, 2, 3, 4)

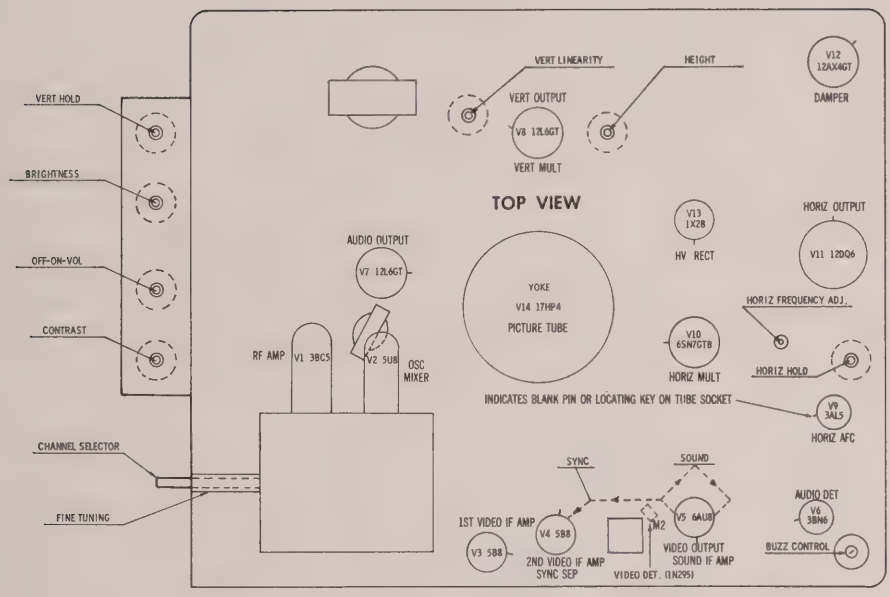


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

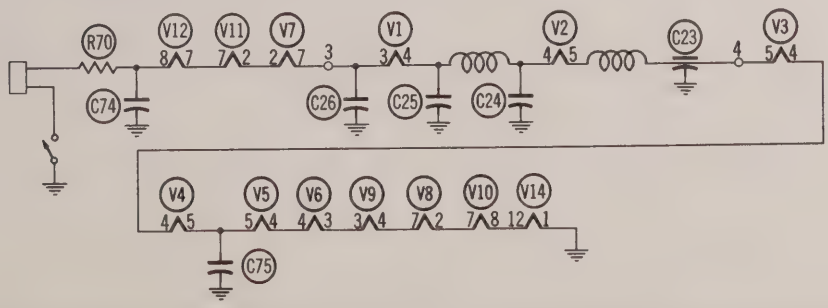
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifier (M1)**

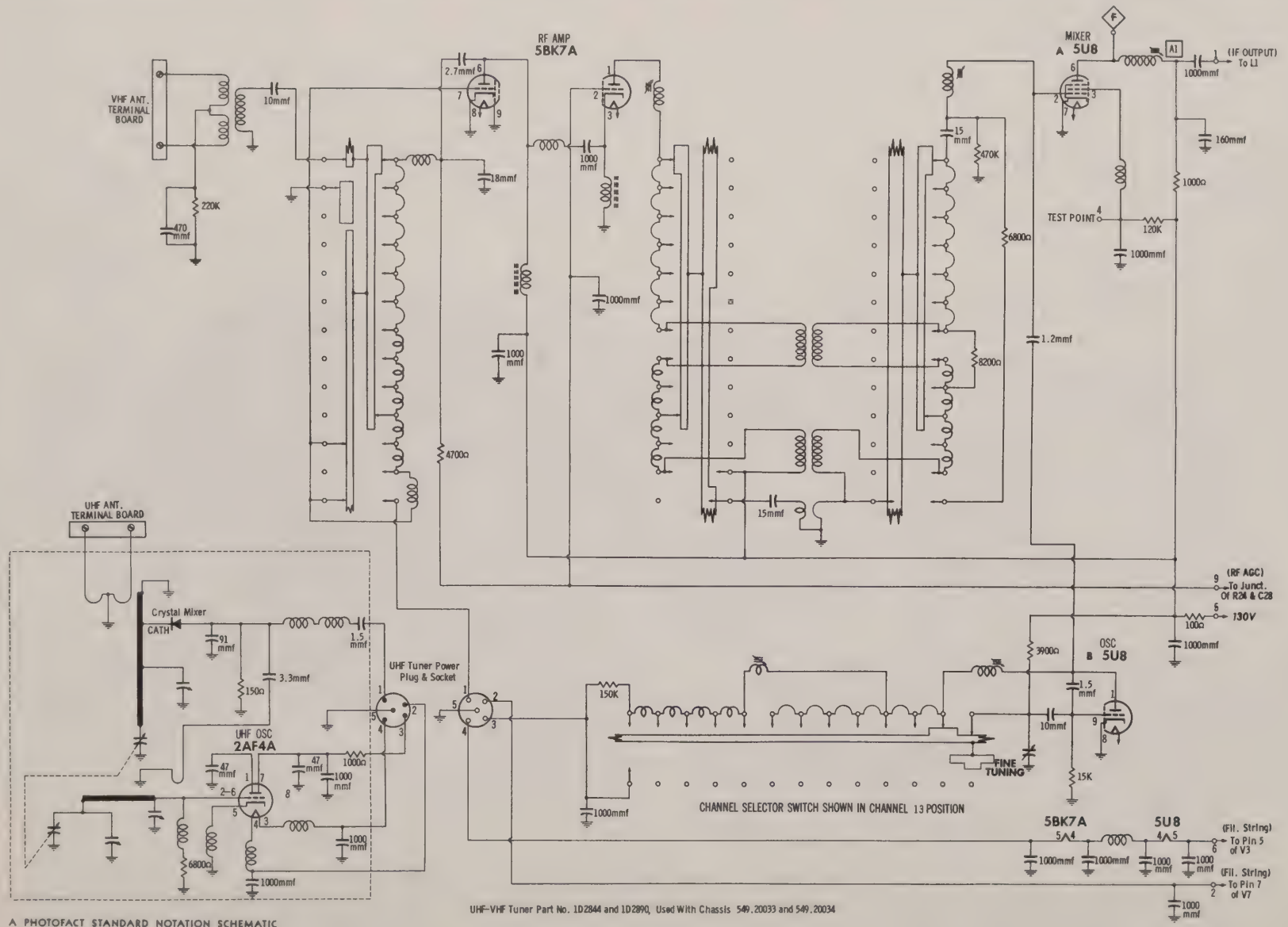
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V5, V14**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V3, V4, V8**
No horiz. sync - **V4, V9, V10**
No vert. or horiz. sync - **V4**

SWEEP FAILURE
No raster, has sound - **V10, V11, V12, V13, V14**
No vertical deflection - **V3, V10**
Poor vert. linearity or foldover - **V3, V10**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, V13, M1**
Vert. off freq. - **V3, V4, V8**
Horiz. off freq. - **V4, V9, V10**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See circuit below).





UHF-VHF Tuner Part No. 1D2844 and 1D2890, Used With Chassis 549.20033 and 549.20034

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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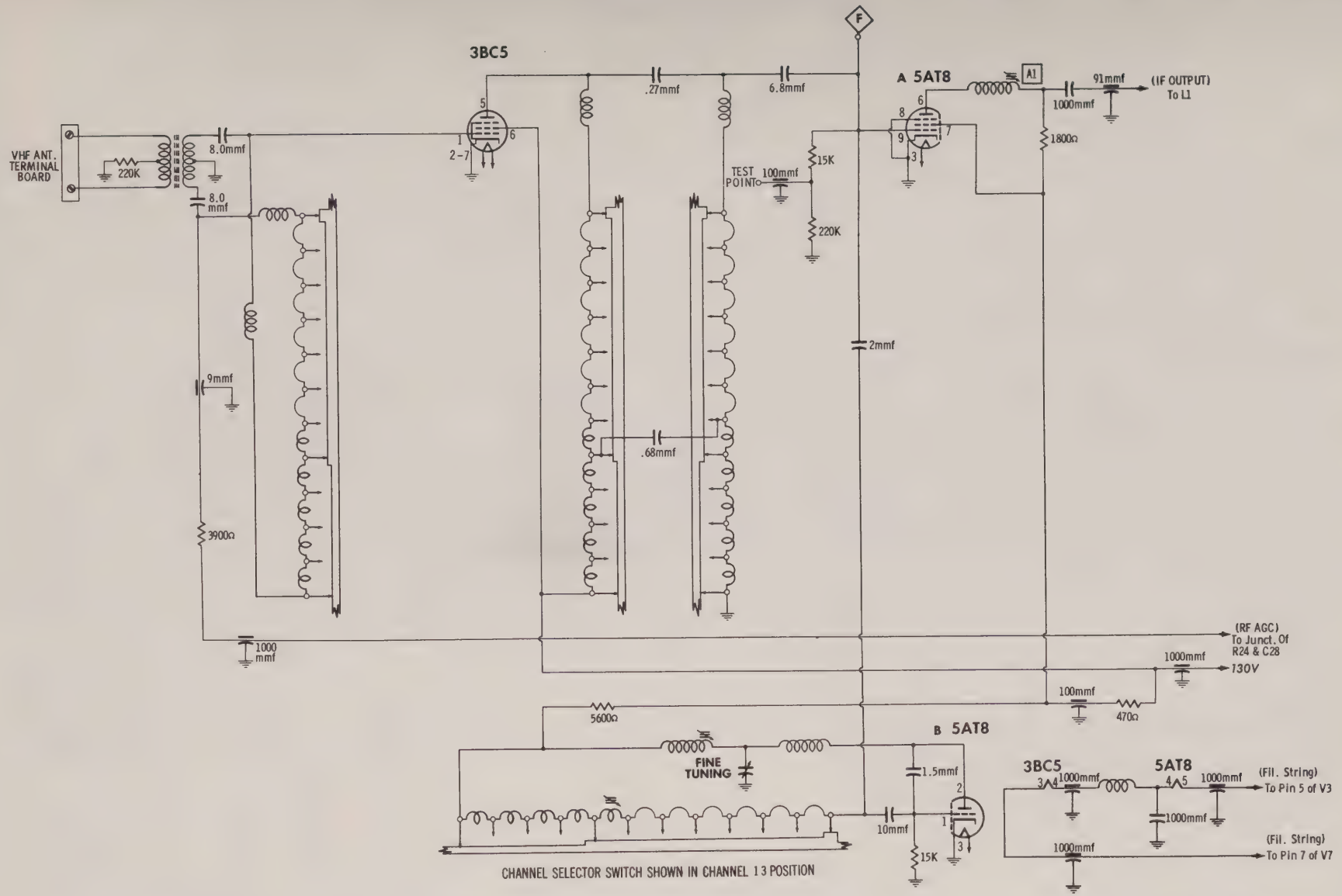
ALTERNATE UHF-VHF TUNER SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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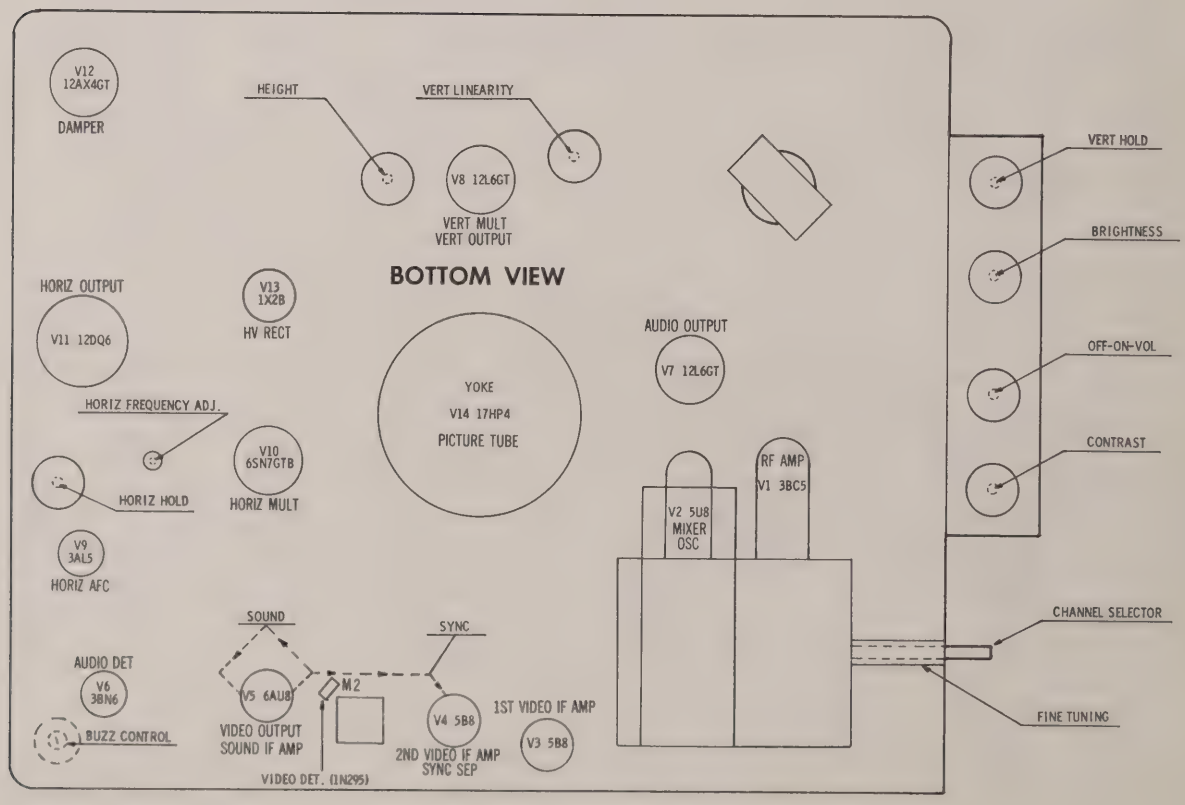
VHF Tuner Part No. 1D2619 Used With Chassis 549.20032

ALTERNATE VHF TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	13Ω	12Ω	† 800Ω	† 3000Ω	0Ω		
V2	5U8	† 7000Ω	100K	† 27K	12Ω	11Ω	† 1300Ω	0Ω	0Ω	15K
V3	5B8	0Ω	● 900K	● † 1.5Meg	9Ω	11Ω	1Meg	56Ω	† 170Ω	† 170Ω
V4	5B8	0Ω	2.2Meg	† 20K	9Ω	8Ω	.1Ω	180Ω	† 170Ω	† 170Ω
V5	6AU8	0Ω	100K	† 35K	7Ω	8Ω	85Ω	1Meg	† 21Ω	† 3300Ω
V6	3BN6	● 250Ω	.3Ω	6Ω	7Ω	† 2200Ω	4.6Ω	† 700K		
V7	12L6GT	TP	15Ω	† 210Ω	† 18K	● 150K	TP	13Ω	120Ω	
V8	12L6GT	TP	3Ω	† 270Ω	† 21Ω	● 2Meg	TP	5Ω	0Ω	
V9	3AL5	1Meg	1000Ω	6Ω	5Ω	1Meg	0Ω	2Meg		
V10	6SN7GTB	● 130K	† 80K	750Ω	3Meg	† 15K	750Ω	3Ω	1Ω	
V11	12DQ6	TP	15Ω	TP	† 200Ω	500K	TP	18Ω	0Ω	TOP CAP ▲ 11Ω
V12	12AX4GT	NC	TP	350K	NC	† 21Ω	NC	18Ω	20Ω	
V13	1X2B	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP ▲ 470Ω
V14	17HP4	0Ω	12Ω	Pin 6 ▲ 27K	Pin 10 ▲ 27K	Pin 11 ● † 300K	Pin 12 1Ω			

† MEASURED FROM OUTPUT OF M1.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 3 OF V12.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C28. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to floating tube shield over converter tube. Low side to chassis chassis.	44MC	42.75MC 45.75MC	Any non-interfering channel.	Vert. amp. thru detector (Fig. 1) to point Ⓐ. Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 2.
2.	"	High side to point Ⓑ. Low side to chassis.	"	"	"	Vert. amp. to point Ⓒ thru detector (Fig. 1). Low side to chassis.	A3, A4	"
3.	"	High side to point Ⓓ. Low side to chassis.	"	"	"	Vert. amp. thru detector (Fig. 1) to point Ⓔ. Low side to chassis.	A5, A6	"
4.	"	High side to point Ⓕ. Low side to chassis.	"	"	"	"		Check for response curve similar to Fig. 3. If necessary, retouch A1 thru A6 for desired response.

4.5MC TRAP ALIGNMENT

Set the contrast control maximum clockwise and volume control to mid-range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to point Ⓔ. Low side to chassis.	Not used.	4.5MC (30% 400∿ AM Mod.)	Any	Vert. amp. thru detector (Fig. 4) to point Ⓖ. Low side to chassis.	A7	Detune A7 and A8 by turning out of coil. Adjust A7 for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT

Set the contrast control to maximum clockwise, the volume control to mid-position and the buzz control (R8) 90° from clockwise stop.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point Ⓔ. Low side to chassis.	4.5MC (7.5KC Swp)		Any	Across voice coil.	A8, A9, A10	Turn A8 fully counter clockwise then clockwise for maximum indication on scope. Adjust A9 and A10 for maximum indication.
7.	"	"	"		"	"	R8	Increase generator output above limiting of 6BN6. Adjust buzz control for MINIMUM 400∿ indication on scope.
8.	"	"	"		"	"		With generator output above limiting level of 6BN6, retouch A8 for maximum indication on scope.

TUNER ALIGNMENT

9. This position of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

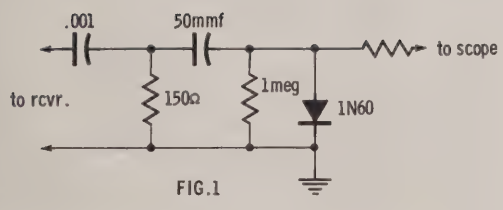


FIG.1

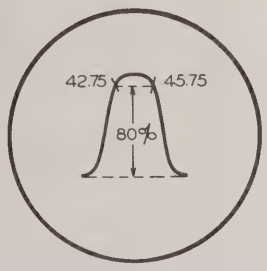


FIG. 2

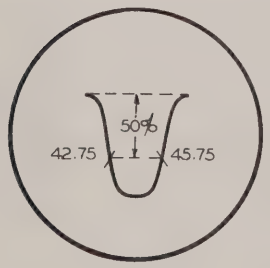


FIG. 3

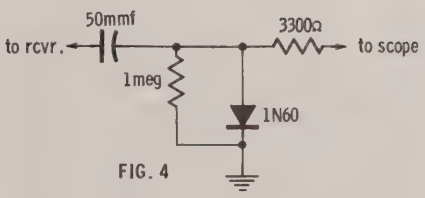


FIG. 4

SILVERTONE MODELS 6104, 6105
(Ch. 549.20030, 1, 2, 3, 4)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	5BC5	
V2	Mixer-Osc	5U8	
V3	1st Video IF Amp. - Vert. Mult.	5U8	Note 1
V4	2nd Video IF Amp. - Sync Clipper	5U8	
	Video Output -	6AU6	
V5	Sound IF Amp. Audio Det.	5BN6	

Note 1: Not used in chassis 549. 20030.

ITEM No	USE	TYPE	NOTES
V7	Audio Output	12L8GT	
V8	Vert. Mult. -Vert. Output	12L8GT	
V9	Horiz. AFC	3AL5	
V10	Horiz. Mult.	6GN7GT/B	
V11	Horiz. Output	12DQ6	
V12	Damper	12AX4GT	
V13	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	SILVERTONE PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V14	17BP4	17BP4/17BP4	17RP4/17BP4	17BP4/ 17BP4	① Aluminized ② Silver Screen "85"
		17BP4B ①	17MP4B ①	17BP4B ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	48-333	RE1037		WT330	CDB1015	FD-0-95	R3215 *
B	250	150						MT-1508	
C	10	10							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No	NOTES
C3	470	500	47X30B471M	BPD-00047	DD-471	KD60	81-471	UC-5347	5GA-T47	
C4	470	500	47X30B471M	BPD-00047	DD-471	KD60	81-471	UC-5347	5GA-T47	
C4	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C5	15			NPO-S15	TCZ-15	TZ11	NP0K-150		5TCC-Q15	
C6	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C7	56			SM70	D5-471	TP48	81-471	UC-5347	5GA-T47	
C8	18									
C9	3									
C10	1.8									
C11	15			NPO-D15	TCZ-15	2021	NP0K-150		5TCC-Q15	
C12	60									
C13	1.5			NPO-E1.5	TCZ-1R5	2004	NP0A-1R5		2T-5515	5TCCB-V15
C14	6.8			NPO-D6.8	TCZ-6R8	2013	NP0A-6R8		2T-5568	5TCCB-V68
C15	6.8			NPO-D6.8	TCZ-6R8	2013	NP0A-6R8		2T-5568	5TCCB-V68
C16	68									
C17	1000			BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C18	56			NPO-S15E	TCZ-56	7224	NP0-337-560			
C19	56									
C20	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C21	5000			BPD-005	DD-503	KD80	801-005	DC525	5HK-D5	
C22	5000			BPD-005	DD-503	KD80	81-005	DC525	5HK-D5	
C23	500			RF-501	MFT-1000				505C-D1	
C24	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C25	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C26	1000			BPD-001	DD-102	KD69	801-001	DC521	5HK-D1	
C27	.1	400	46AU1047	P468N-1	DF-104	CU124P1		PT401	4TM-P1	
C28	.25	300	46AT2547	P258N-25		CU3D3P25		PT2525	5TMC-E25	
C29	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C30	390		47A504	DM-00039	DM-391	5RST39	81-391		MS-339	Note 2
C31	390		47A504	DM-00039	DD-391	5RST39	81-391		MS-339	Note 2
C32	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C33	.47		47B403-S	NPO-S14.7	TCZ-4R7	2010	NP0A-4R7		2T-5547	5TCCB-Y47
C34	10		47CA30A100K	NP0-E10	TCZ-10	2018	NP0A-100		2T-541	5TCC-Q
C35	1.5	250	48A343	P158N-1	DF-104	CU3B3P1		PT401	4TM-P1	5TCC-Q
C36	68		47B479							
C37	.1	400	46AU1047	P468N-1	DF-104	CU4B4P1		PT401	4TM-P1	
C38	.25	300	46AZ1547	P258N-25		CU3D3P25		PT2525	5TCC-Q	
C39	10		47B478							
C40	33		47B478							
C41	47		47CA30A470M	S147	D5-470	TP39	GP1K-470	UC-5447	5GA-Q47	
C42	3		47A307	NPO-S3	TCZ-3R3	5007	NP0A-030	2T-553	5TCCB-V33	
C43	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521		
C44	470	500		1469-00047	D5-471	5R97Y47	81-471		MS-347	
C45	15									
C46	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C47	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C48	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C49	10000		47A234	BPD-01	DD-103	KD68	81-01	DC531	5HK-S1	
C50	10000		47A334	BPD-01	DD-103	KD68	81-01	DC531	5HK-S1	
C51A	270					KD63	81-01	DC531	5HK-S1	
B	10000		748A046	†PA-583	†PC-383	KD68	81-01	DC531	5HK-S1	
C	25						83I-350	UC-5425	5GA-Q25	
C52	330		47-606	DI-00083	D5-331		GD67		5TCC-Q33	
C53	3000		47A398	BPD-003	DD-303	KD73	801-003	DC522	5HK-D3	
C54	3300		48BR392E4	1464-0039		1RSD392		MC5463	MS-339	
C55	1000		47-503	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C56	.047	400	46AW4732	BPD-05	DF-503	CUB4B47		PT4147	4TM-S47	
C57	.047	400	46AW4732	BPD-05	DF-503	CUB4B47		PT4147	4TM-S47	
C58	1000		47-505	BPD-01	DD-103	KD68	81-01	DC531	5HK-S1	
C59	75		47CA30A750K	NP0-S175	TCZ-75	2039	NP0-337-750		5TCC-Q75	Note 3
C60	75		47CA30A750K	NP0-S175	TCZ-75	2039	NP0-337-750		5TCC-Q74	Note 4
C61	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C62	1000		47A598	DN-001	DD-103	KD69	801-001	DC521	5HK-D1	
C63	.1	150	46A343	P168N-1	DF-104	CUB3P1		PT401	4TM-P1	
C64	100		47X30B101K	NPO-S100	TCZ-100	2JS101	NP0-337-101	MC8235	M8-31	
C65	.0039	400	46BR392E4	1464-0039		1RSD392		MC5463	MS-339	
C66	.0039	400	47X2G392K	1464-00033	D5-331	5R5Y33	81-331		MS-333	
C67	680	500	47X20B68LK	1464-00068	D5-681	5R57Y68	81-681		MS-368	
C68	.005	200	47-506	BPD-005	DD-502	CUB4D5	GP3-333-502	PT635	5TM-D5	
C69	.820		47-506	S1B20	D5-821	GD87	81-821		5GA-T82	
C70	.15	600	46AX154J	P468N-15				PT6015	5TM-P15	
C71	68	1000	47B475	HVD-30-68	DD30-680	V3Q68	3KV-680	DC30468	30QA-Q68	
C72	47	3000	47-439	HVD-30-47	DD30-470	V3Q47	3KV-470	DC30447	30QA-Q47	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No	AEROVOX PART No.	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C73	.25	200	48AT2547	P258N-22		CUB2P25		PT6025	2TM-P25	
C74	10000		47A234	BPD-01	DD-103	KD68	81-01	DC531	5HK-S1	
C75	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	
C76	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	Note 1
C77	1000		47A230	BPD-001	DD-103	KD69	801-001	DC521	5HK-D1	Note 1

† Items C8A, C53B, C53C, R43A and R43B are combined in one unit.
Note 1: Not used in chassis 549. 20031.
Note 2: Chassis 549. 20033, 549. 20033 and 549. 30034 use 680MMF in this application. (part #47A683)
Note 3: Chassis 549. 20032, 549. 20033, and 549. 30034 use 100MMF in this application. (part #47CA29A101M)
Note 4: Chassis 549. 30033, 549. 30033 and 549. 30034 use 47MMF in this application. (part #47CA30A470M)

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	25B1107	AB-515		QIT-109	U5	Contrast
B	Shaft		Not Req.	AB-5		Not Req.	Not Req.	Attach to R1A
R2A	350K	½	25B1101	B-60-S	A67-500K-Z	QI3-133	TA334A	Volume
B	Shaft		Not Req.	Not Req.		Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	Not Req.	SWK-12	76-1	U8-38	Attach to R2A
R3	5Meg	½	25B1254			QIT-141	TA56B	Brightness
R4A	1. 5Meg	½	25B1256	AB-742	A47-1.5Meg-S	QU-139	TA15L	Vert. Hold
B	Shaft		Not Req.	AB-5	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	2Meg	½	25B1255	AB-79	A47-2Meg-S	QU-130	PTA24L	Vert. Linearity
B	Shaft		Not Req.	AB-4	KS8-3	Not Req.	Not Req.	Attach to R5A
R6A	5Meg	½	25B1098	AB-85	A47-5Meg-S	QU-141	†PTA35L	Height With 1Meg Stop
B	Shaft		Not Req.	AK-18	RN-3	TQ	Not Req.	Attach to R6A
R7A	75K	½	25B1105	AB-35	A47-75K-S	QU-125	PTA1L	Hold - Note #1
B	Shaft		Not Req.	AK-4	KS8-3	Not Req.	Not Req.	Attach to R7A
R8	5000	2	25A1095		39-500			Brass (Wire-wound)

* Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)
Note 1: Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No	IRC PART No.	NOTES
R9	470K		23X30X474X	BTS-470K	
R10	470K		23X30X474X	BTS-470K	
R11	2200Ω				
R12	15K			BTS-15K	
R13	4700			BTS-470	
R14	2200Ω			BTS-2200	
R15	56Ω				
R16	10K			BTS-10K	
R17	100K			BTS-100K	
R18	15K			BTS-15K	
R19	6800Ω			BTS-6800	
R20	27K			BTS-27K	
R21	1000Ω			BTS-1000	
R22	100Ω			BTS-100	
R23	220Ω		23X30X23X	BTS-230	
R24	10K		23X30X10X	BTS-10K	
R25	150Ω		24X30X15X	BTS-150	
R26	56Ω		23X30X56X	BTS-56	
R27	150Ω		23X30X15X	BTS-150	
R28	180Ω		23X30X18X	BTS-180	
R29	1Meg		23X30X105X	BTS-1Meg	
R30	6800Ω		23X30X682X	BTS-6800	
R31	1Meg		23X30X105X	BTS-1Meg	
R32	3300Ω	2	23X30X332X	BTS-3300	
R33	120K	1	23X30X12*K	BTA-120K	
R34	27K		23X30X27X	BTS-27K	
R35	100K		23X30X104X	BTS-100K	
R36	33K		23X30X333X	BTS-33K	
R37	470Ω		23X30X471X	BTS-470	
R38	2200Ω	1	23X30X222X	BTA-2200	Note 1
R39	680K		23X30X684X	BTS-680K	
R40	18K		23X30X18X	BTS-18K	
R41	3300		23X30X331X	BTS-330	
R42	15K		23X30X15X	BTS-15K	

† Items R43A, R43B, C51A, C51B and C51C are combined in one unit.
Note 1: In chassis 549. 30030 a 10K, 1W resistor is used in this application. (Part #23X30X103K)
Note 2: In chassis 549. 30030 a 47K resistor is used in this application. (Part #23X30X473K)
Note 3: In chassis 549. 30030, 549. 30033 a 450, 20W(WW) resistor is used in this application. (Part #24B1048)
Note 4: Used in chassis 549. 20030 only.
Note 5: Used in chassis 549. 20033, 549. 20033 and 549. 20034 only.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SILVERTONE PART No	IRC PART No.	NOTES
R43A	330K		†40A046	BTS-330K	
B	3. 3Meg			BTS-3. 3Meg	
R44	33K	1	23X30X333X	BTA-33K	
R45	18K	1	23X30X183X	BTA-18K	
R46	68K		23X30X683X	BTS-68K	
R47	100K		23X30X104X	BTS-100K	
R48	100K		23X30X104X	BTS-100K	
R49	100K		23X30X104X	BTS-100K	
R50	470K		23X30X474X	BTS-470K	
R51	180K		23X30X184X	BTS-180K	
R52	5. 6Meg		23X30X355X	BTS-5. 6Meg	
R53	100K		23X30X104X	BTS-100K	Note 3
R54	680Ω		23X30X681X		
R55	680Ω		23X30X681X		
R56	1000Ω		23X30X102X		
R57	1Meg		23X30X105X		
R58	15K		23X30X155X		
R59	7500 6%		23X30X751J	BTS-750 6%	
R60	68K		23X30X683X	BTS-68K	
R61	82K		23X30X823X		
R62	330K		23X30X334X	BTS-330K	
R63	68K		23X30X683X		
R64	82K		23X30X823X		
R65	330K		23X30X334X		
R66	47000		23X30X473X		
R67	470K		23X30X474X		
R68	33K		23X30X333X		
R69	180K		23X30X184X		
R70	40Ω	20	24B1063		Note 3
R71	5Ω	5	24-1078		
R72	5. 3Meg		23X30X535X	BTS-3. 3Meg	Note 4
R73	47500		23X30X473X		Note 4
R74	470		23X30X470X		Note 5

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C IMP	REPLACEMENT DATA SILVERTONE PART No	QUAM PART No	RCA TYPE No.	NOTES
SP1	4' 6	PM PM	3-4Ω	6SC-175-A ① 9SC-186 ②	4A07	223S1	① Used in chassis 549. 20033, 549. 20033 & 549. 20034. ② Used in chassis 549. 20031 & 549. 30030. $ Audio Output Transformer Mounted on Speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	. 1Ω		SI-3104		TV-131	6325	
L2	3rd Video IF	. 1Ω	. 1Ω	SI-3106		TV-130	6324	
L3	3rd Video IF	. 1Ω	. 1Ω	50-988		TV-135*	6324*	
L4	Series Peaking Coil	4Ω		S3A307	19-1006		6634	16 Microhenries
L5	Shunt Peaking Coil	14Ω		SI-3101			6656	806 Microhenries
L6A	4. 5MC Trap	. 8Ω						
B	1st Sound IF	2. 5Ω		51B1996				
L7	Shunt Peaking Coil	8. 5Ω		SI-3101		18-1400*	6134*	395 Microhenries; Wound on a 3. 9K resistor.
L8	Series Peaking Coil	8. 5Ω		SI-3100	19-1180*	TV-184*	6180*	185 Microhenries; Wound on 47K resistor.
L9	2nd Sound IF	. 1Ω	. 3Ω	SI-3103				
L10	Quadrature C Coil	4. 8Ω		51A1897			1480	Used in chassis 549. 20030 only.
L11	FIL Choke			53A353				Used in chassis 549. 20030 only.
L12	RF Choke			53A343				

* Use adaptor plate.
@ Parallel with 3. 9K resistor.
& Parallel with 47K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Sorn PART No.	Thordarson PART No.	NOTES
L13	46Ω		51B3109	19-1176	TV-163	6310			RS-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL EFFECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ⁰⁄₀₀	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L14	. 240A	21Ω	10Y	54B214	C-9040		C-2137	24C41	C-23X	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	. 240A	37A318	1090A	MR-300	82300	624	300	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA SILVERTONE PART No.	SYLVANIA PART No	NOTES
M2	*1N296	19C1864	1N80	Video Det. (Pigtail)

* Some versions may use crystal diode types 1N60 or CK-706A in this application.

MISCELLANEOUS

ITEM No	PART NAME	REPLACEMENT DATA SILVERTONE PART No.	NOTES
M3	Tuner	1E2833	VHF Chassis 549. 20031, 549. 20030.
	Tuner	1D2819	VHF Chassis 549. 20032.
M4	Tuner	1D2844	VHF-UHF Combination. Chassis 549. 20033.
	Tuner	[redacted]	VHF-UHF Combination. Chassis 549. 30034.
M5	Centering Device	21B316	
M6	Don Trap	21B182	
	Cabinet	78-1295	Chassis 549. 20030, 549. 20031.
	Cabinet	78-1296	Chassis 549. 20032, 549. 20033, 549. 20034.
	Knob	15-947	VHF Channel Selector (Blonde) All Chassis.
	Knob	15-987	VHF Channel Selector (Clear) Chassis 549. 20033, 549. 20033, 549. 20034.
	Knob	15A798	Control (Blonde) 4 Used. All Chassis.
	Knob	15D783	Fine Tuning (Clear) All Chassis.
	Knob	15-984	Fine Tuning (Blonde) Chassis 549. 20033, 549. 20033, 549. 30034.
	Knob	15-985	Calibrated UHF Insert-Chassis 549. 20033, 549. 20034.
	Knob	15-985	UHF Tuning-Chassis 549. 20033, 549. 20034.
	Handle	30-375	
	Mask	7A655	
	Safety Glass	220423	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	2. 4K	3-4Ω	55B348	22101	A-3025	A-3322	26S58 ①	S-12X	① Drill one new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA SILVERTONE PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Rom PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	55D285				V307 ②	A-3815	26S72 ③	A-30EX ②
T2	Vert. Output Trans.	55B347	21I01 ①	A-3233 ②		V70F20/45	DY-11A ②	Y-10 ③	Y-19-1 ②
T3A	Yoke-Horiz. (30M19)	53-577 ③	DF-6025 ③	MDF-73 ③	222D1-3 ①	V70F20/45	DY-11A ③		
B	Vert. (42M28)								

① Use 7 to 1 turns ratio.
② Drill new mounting hole(s).
③ Includes capacitor C75; resistors R54 and R55.
④ Connect horiz. damping capacitor across terms #1 and #2.
⑤ Use existing yoke damping network if necessary.
⑥ Remove capacitor from terms #3 and #7.

TRANSFORMER (SWEEP CIRCUITS)

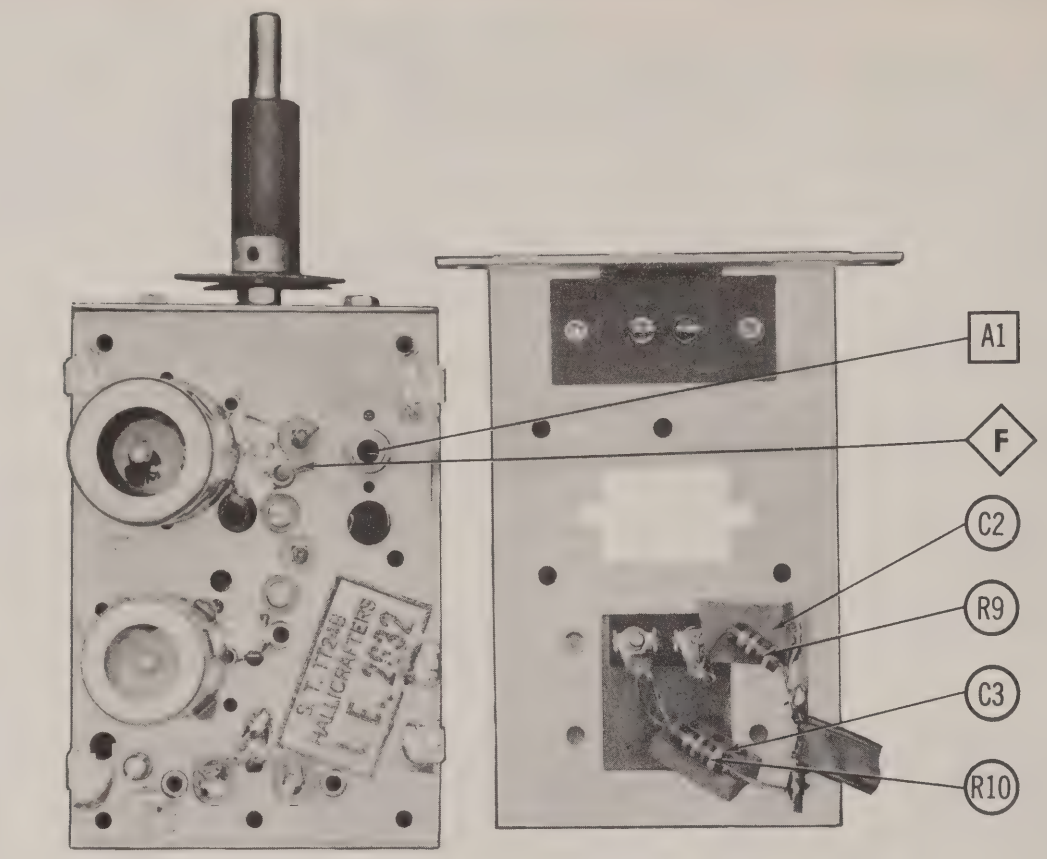
ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No	Merit PART No	RCA TYPE No	Rom PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	55D285				V307 ②	A-3815	26S72 ③	A-30EX ②
T2	Vert. Output Trans.	55B347	21I01 ①	A-3233 ②		V70F20/45	DY-11A ②	Y-10 ③	Y-19-1 ②
T3A	Yoke-Horiz. (30M19)	53-577 ③	DF-6025 ③	MDF-73 ③	222D1-3 ①	V70F20/45	DY-11A ③		
B	Vert. (42M28)								

① Use 7 to 1 turns ratio.
② Drill new mounting hole(s).
③ Includes capacitor C75; resistors R54 and R55.
④ Connect horiz. damping capacitor across terms #1 and #2.
⑤ Use existing yoke damping network if necessary.
⑥ Remove capacitor from terms #3 and #7.

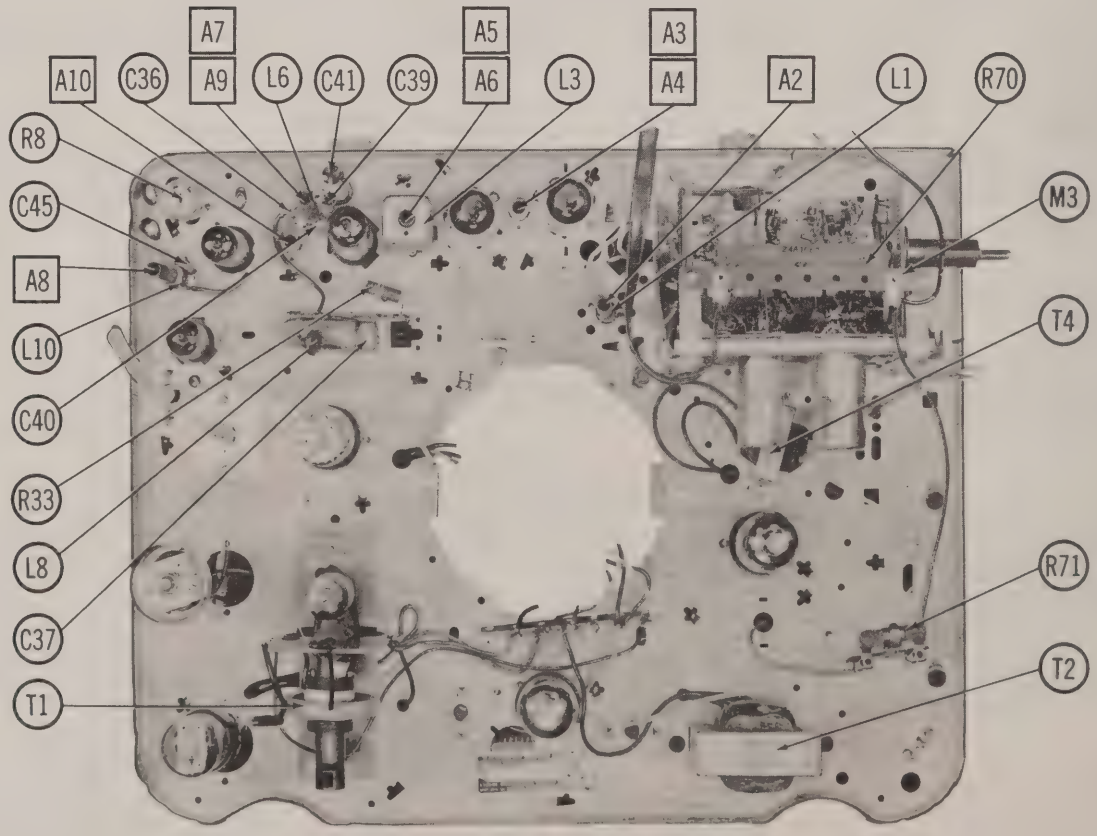
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T4	2. 4K	3-4Ω	55B348	22101	A-3025	A-3322	26S58 ①	S-12X	① Drill one new mounting hole.

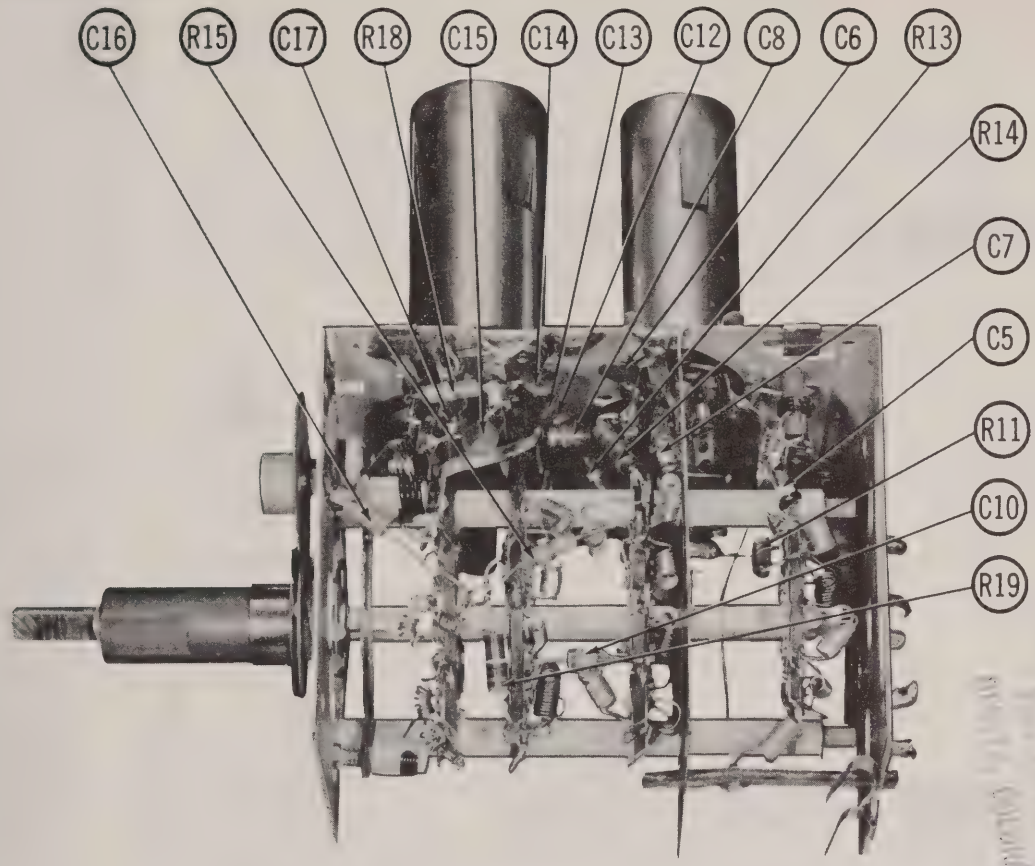
SILVERTONE MODELS 6104, 6105 (Ch. 549.20030, 1, 2, 3, 4)



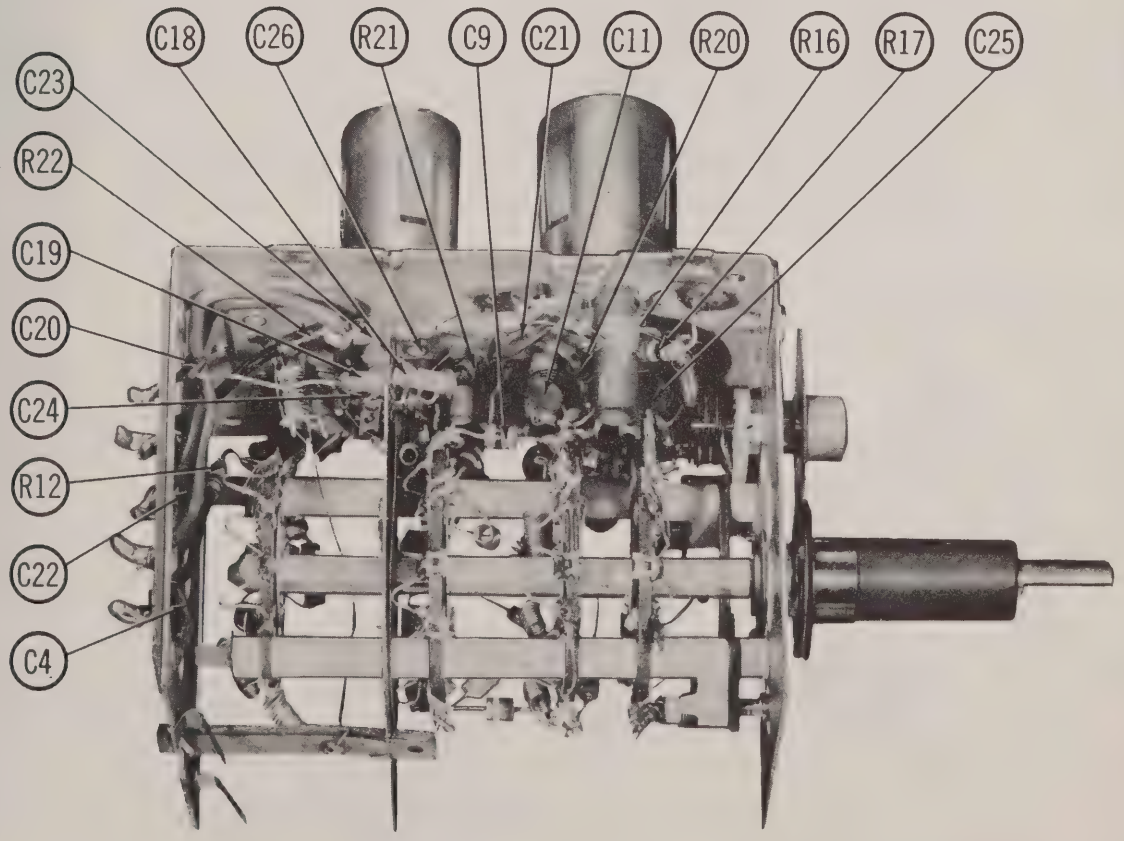
RF TUNER-TOP VIEW



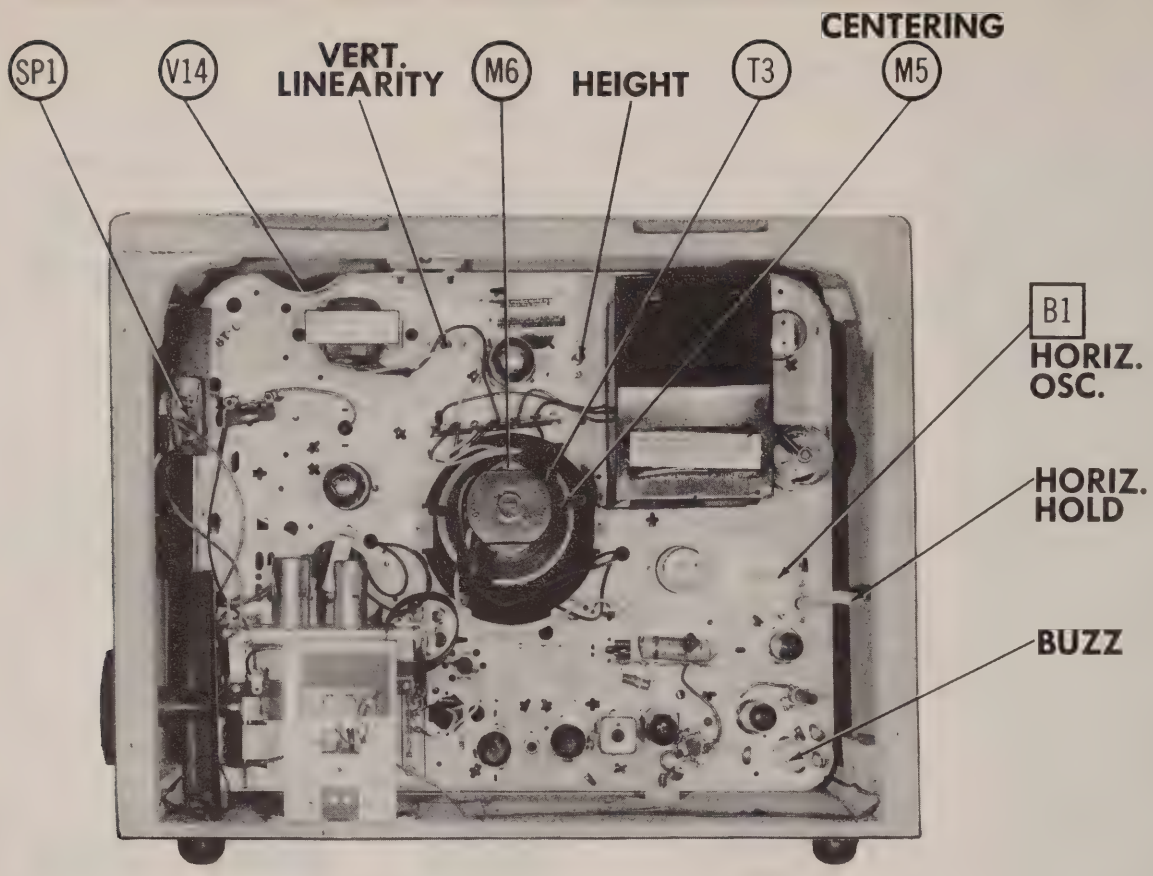
CHASSIS-TOP VIEW



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

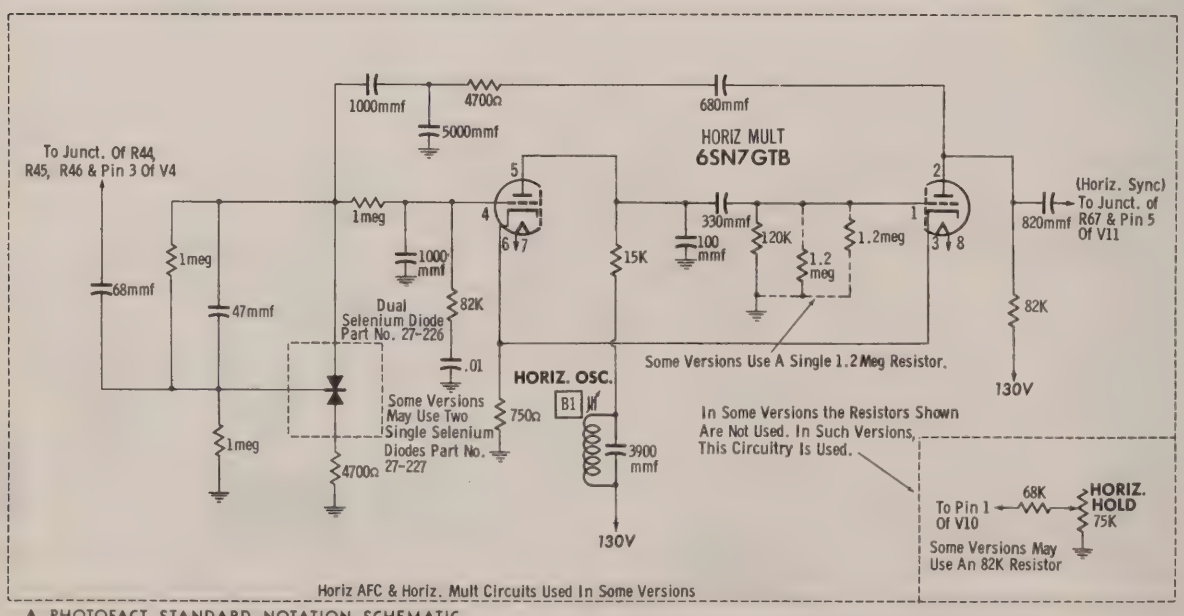


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the horizontal hold control to the mid-range position.

Adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.



Horiz AFC & Horiz. Mult Circuits Used In Some Versions

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ALTERNATE HORIZ. AFC & HORIZ. MULT. SCHEMATIC

STEELMAN
MODEL 3RP4

STEELMAN
MODEL 3RP4

TRADE NAME	Steelman Model 3RP4
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver With 3 Speed Manual Record Player
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available, if not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400∿ mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

STEELMAN MODEL 3RP4

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC. -AF Amp.	12AT6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V4040	BBRT44215	TCT3116	TDLT-4	FMT-312	TVA-3448
B	40	150		20					
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	270			S1270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C4	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C5	270			S1270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C6	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C8	.01	600		BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C9	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VC-42	AB-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

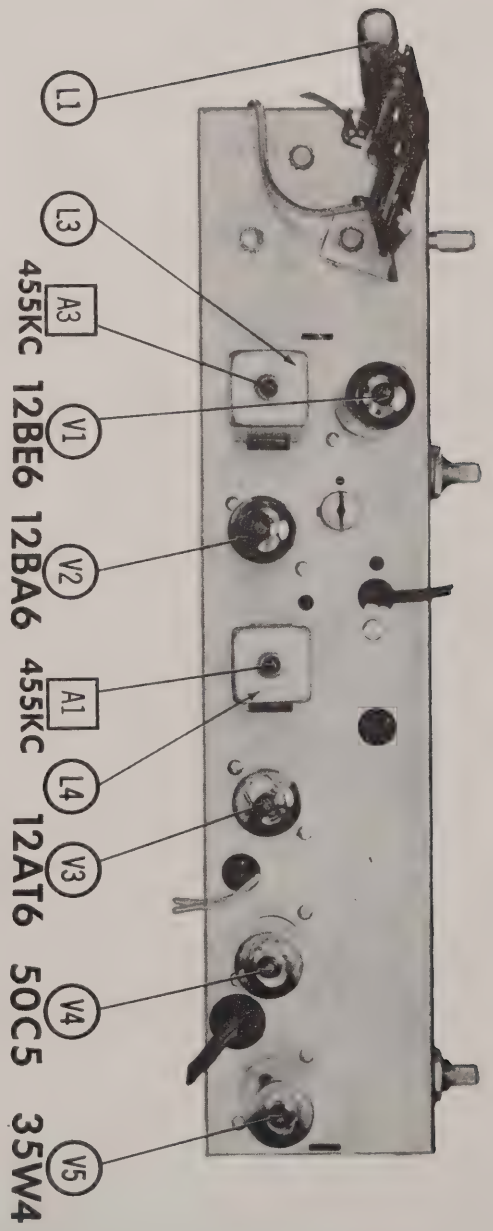
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	220Ω			BTS-220	
R4	2.2Meg			BTS-2.2Meg	
R5	2.2Meg			BTS-2.2Meg	
R6	220K			BTS-220K	
R7	4.7Meg			BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R8	220K			BTS-220K	
R9	470K			BTS-470K	
R10	150Ω			BTS-150	
R11	2200Ω	1		BTA-2200	
R12	330Ω	1		BTA-330	
R13	15Ω			BTS-15	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.3KΩ	3-4Ω	P-896	Z1101	A-3025	A-3332	24S50 ①	S-12X	① Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	SP-40	4A07	223S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	STEELMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.4Ω		LP-FE-14				
L2	Osc. Coil	.6Ω	5.5Ω				69-OSC*	
L3	Input IF	27Ω	26Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	27Ω	27Ω	LF-50	16-6758	BC-353	12-C2	

*Drill new mtg. hole.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		22 ♦P-29	N4-2	♦2460		*Connect for high-output level. ♦Complete tone arm and cartridge assembly.

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

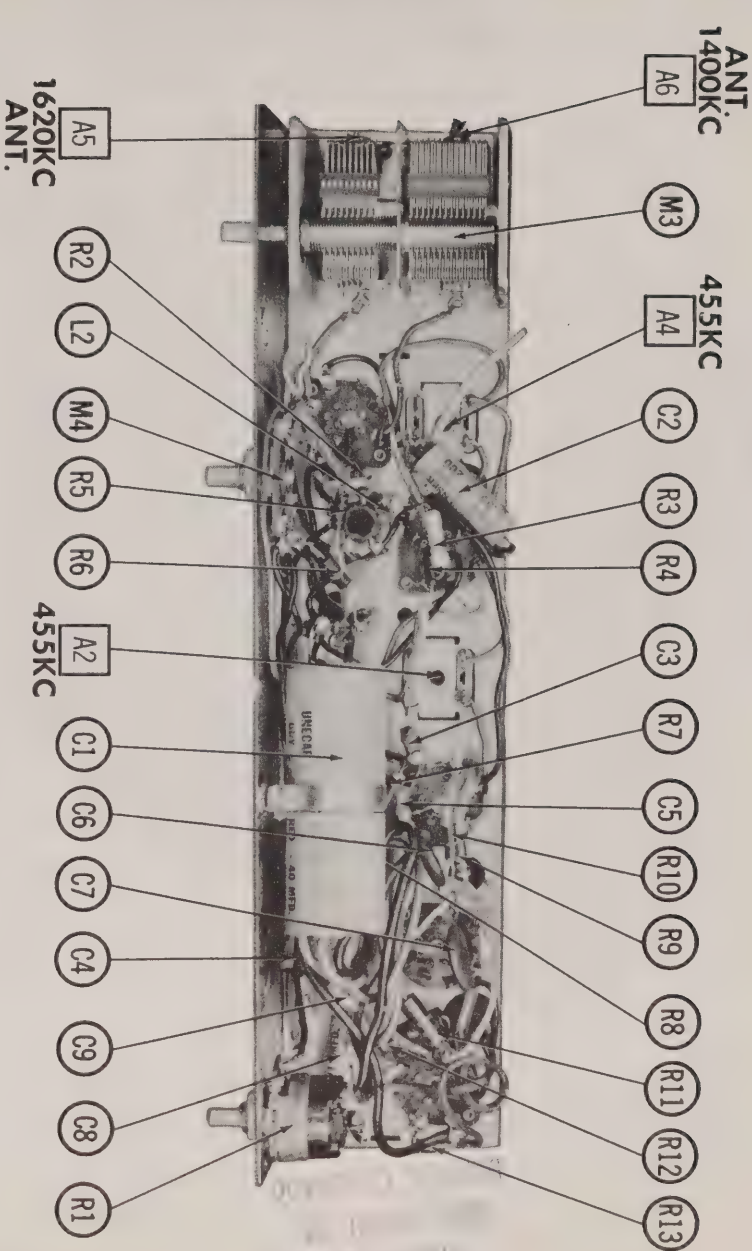
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	STEELMAN PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	
M2		*B-26 or † B-89 or ♦B-89D	* J-752 or * J-152 or † NY-252	*WA400-2 or † WS400-2 or ♦W-400AGD	* Metal † Jewel ♦ Diamond

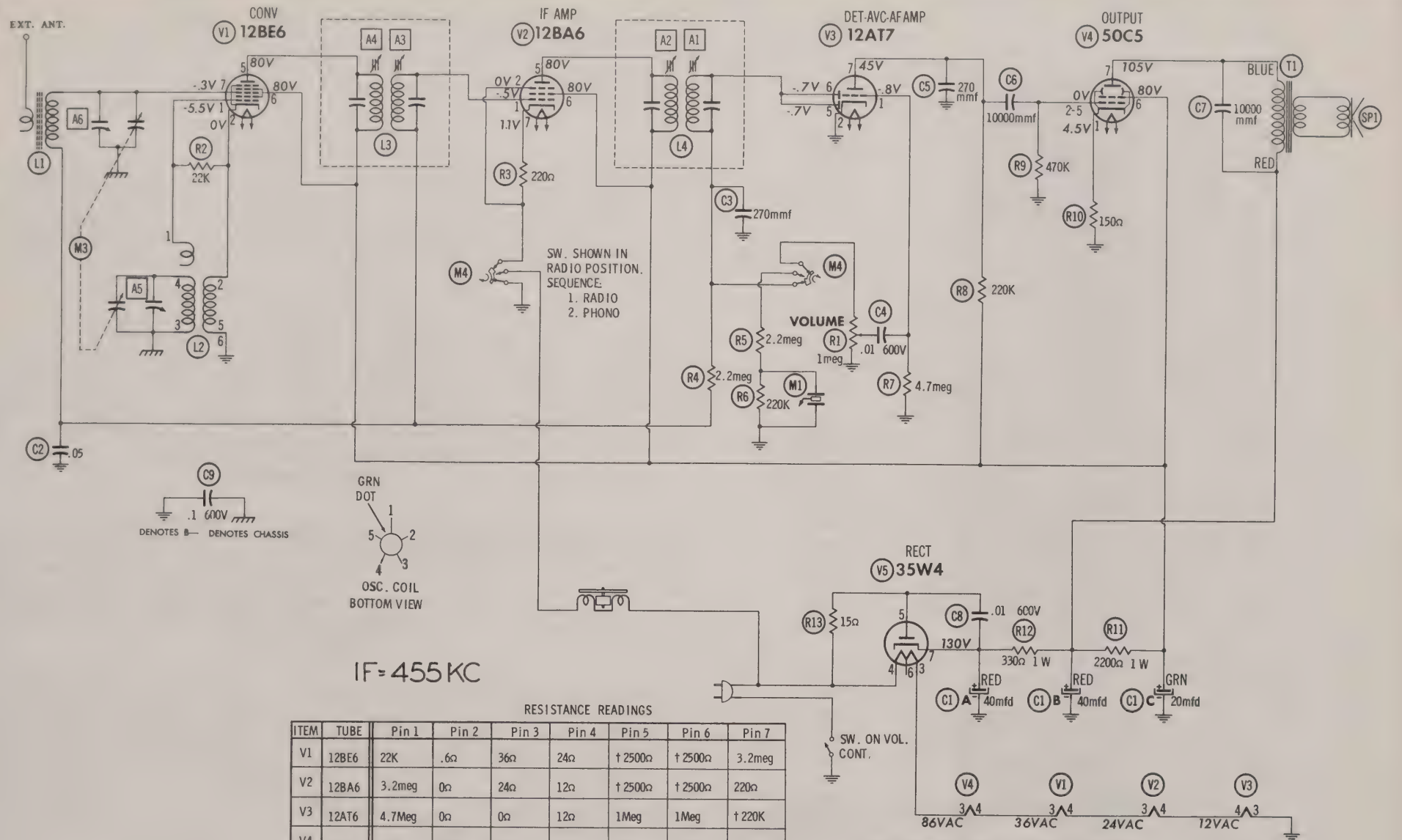
MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M3	Tuning Cap.	CV-62	2 Gang (43-462MMF, 27-195MMF.)
M4	Switch		Radio-Phono (2 Pole - 2 Position, Rotary Wafer Type)

CHASSIS—BOTTOM VIEW



STEELMAN MODEL 3RP4



IF = 455 KC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	36Ω	24Ω	†2500Ω	†2500Ω	3.2meg
V2	12BA6	3.2meg	0Ω	24Ω	12Ω	†2500Ω	†2500Ω	220Ω
V3	12AT6	4.7Meg	0Ω	0Ω	12Ω	1Meg	1Meg	†220K
V4	50C5	150Ω	470K	86Ω	36Ω	NC	†2500Ω	†530Ω
V5	35W4	TP	NC	86Ω	115Ω	130Ω	NC	15K

ALL MEASUREMENTS TAKEN IN RADIO POSITION.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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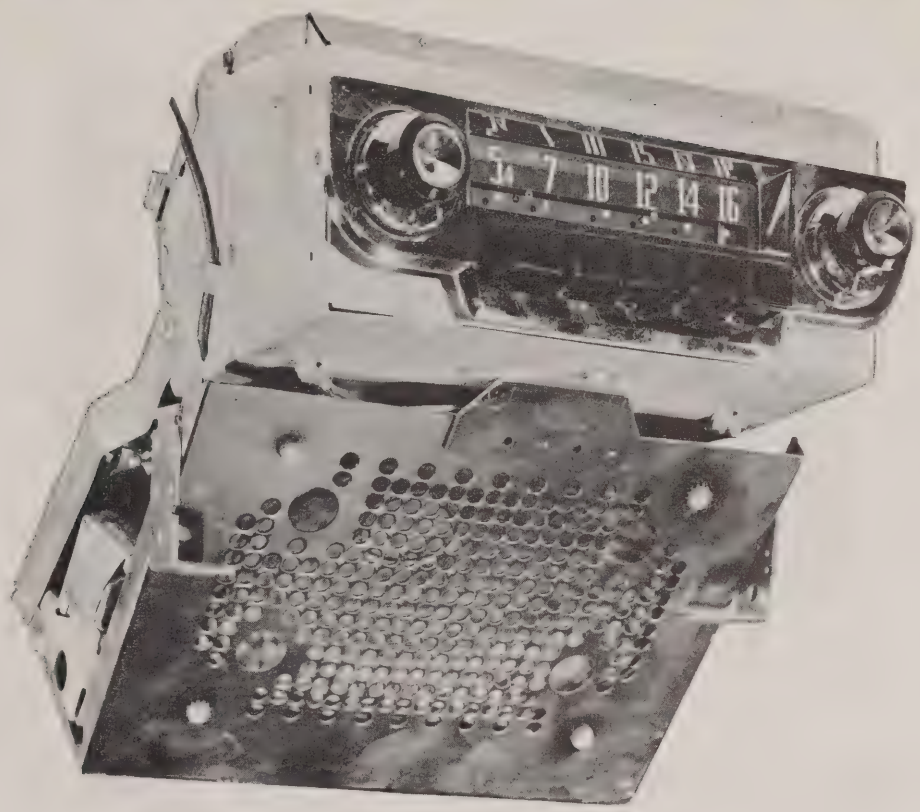
STUDEBAKER
MODELS AC-2745, AC-2747



STUDEBAKER
MODELS AC-2745, AC-2747

TRADE NAME	Studebaker Models AC-2745, AC-2747 (For 1956 Studebaker Automobiles)
MANUFACTURER	Delco Radio Div., G.M. Corp., Kokomo, Ind.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Seven)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12BF6 Det.-AVC-AF Amp., (2) 12V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.51 Amp. @ 12.6 volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Set tone control to treble position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400%Mod)	Extreme high end freq.end of dial	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	82MMF	Thru dummy to antenna receptacle. Low side to chassis.	1615KC	"	"	A5, A6, A7	Preset A8 (osc. core) so that the rear of core is 1 25/32" from mounting end of coil form. Adjust A5, A6 and A7 in order given for maximum output.
3.	"	"	1000KC	Tune to 1000KC signal	"	A9, A10	Adjust for maximum output.
4.	"	"	1615KC	Extreme high frequency end of dial.	"	A6, A7	"
5.	"	"	900KC	Tune to 900KC signal	"		If necessary, adjust pointer adjustment screen so that pointer coincides with 900KC on dial.
6.	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC, adjust A7 for maximum volume.						

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det. -AVC-AF Amp.	12BF6	
V5	Output	12V6GT	
V6	Output	12V6GT	
V7	Rectifier	0Z4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 20	400	6322	AFH3-120	C099	FP345.8	TMT106	T-550	TVL-3739
B	▲ 20	400							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	200	6512	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C3A	15									Note #1
B	39									Note #2
C4	180		7257424							
C5	.047	400	6512	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C6	10	500	G-100	NPO-DI10	DD-100	22R5Q1	831-100	MCB215	MS-41	
C7	220	500	G-221	DI-00022	D6-221	22R5T22	811-221	UC-5322	1FM-322	
C8	.0047	600	6531	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C9	.01	400	6510	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C10	.022	400	6511	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C11	10000		6354	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C12	.1	400	6513	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C13	100		6371	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C14	.003	1000	6563	P1088N-003	DD16-302	CUBI6D3		PT1623	10TM-D3	
C15	.007	1600	H-702	P1688N-007	DD16-702	CUBI6D7		PT1627	16TM-D7	
C16	.47	100	6592	VHC36		ST2P5		RF480	68P20	
C17	.47	100	6592	VHC36		ST2P5		RF480	68P20	
C18	.47	100	6592	VHC36		ST2P5		RF480	68P20	

Note #1. Some versions use single unit (Part No. 6361) in this application.
Note #2. Some versions use single unit (Part No. 6366) in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg		7267398	F1-68	RTV-589C		UF26A	Tone (Panel)
B	250K			R4-37			† UR254-T753	Volume - Tapped at 60K (Rear)
C	Bushing			AK-26	XB-2		EB-158	Attach to R1A
D	Switch			KB-4			US-26	Attach to R1B

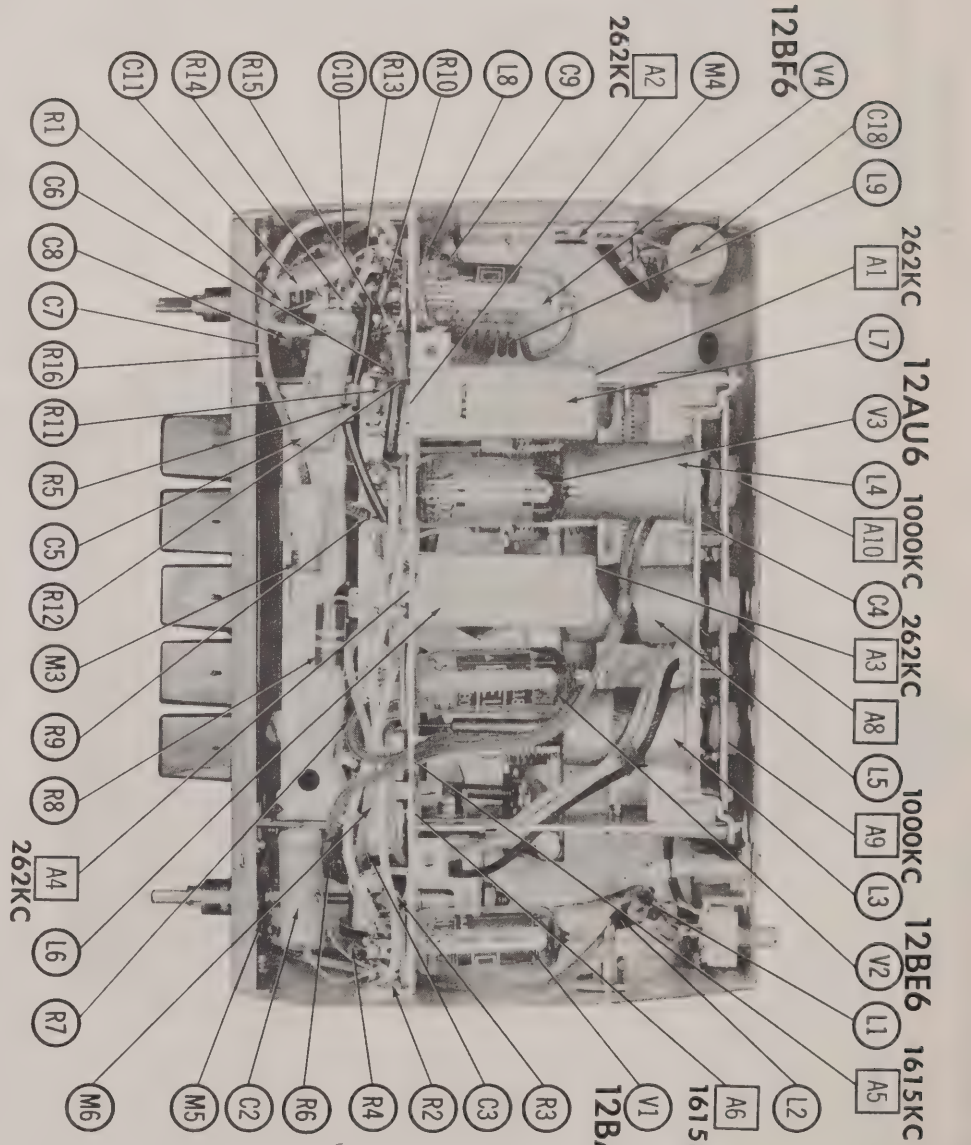
† Universal Replacement (Mallory Exact Duplicate Part No. UE1739S)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA DELCO PART No.	IRC PART No.	NOTES
R2	2.2 Meg		1239	BTS-2.2 Meg	
R3	10K	1	1174	BTA-10K	
R4	68Ω		1111	BTS-68	
R5	1 Meg		1235	BTS-1 Meg	
R6	330K		1229	BTS-330K	
R7	22K		1215	BTS-22K	
R8	15K	2	1277	BTB-15K	
R9	270Ω		1118	BTS-270	
R10	1 Meg		1235	BTS-1Meg	
R11	47K		1219	BTS-47K	
R12	820K		1234	BTS-820K	
R13	1000Ω		1125	BTS-1000	
R14	1 Meg		1235	BTS-1 Meg	
R15	2200Ω		1129	BTS-2200	
R16	47K		1219	BTS-47K	
R17	47K	1	1259	BTA-47K	
R18	360Ω 5%	1	7234563	BW1-360 5%	
R19	1800Ω	2		BW2-1800	
R20	15K	1		BTA-15K	

TUNER CHASSIS



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 1.8A	414VCT @ .048A			6065		P-2978		22R52	

TRANSFORMER (AUDIO INPUT)

ITEM No.	RESISTANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1.8KΩ CT		6061						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	7.8KΩ	3-4Ω	6063	Z1002	A-2936	A-3852	22S87	S-15X	

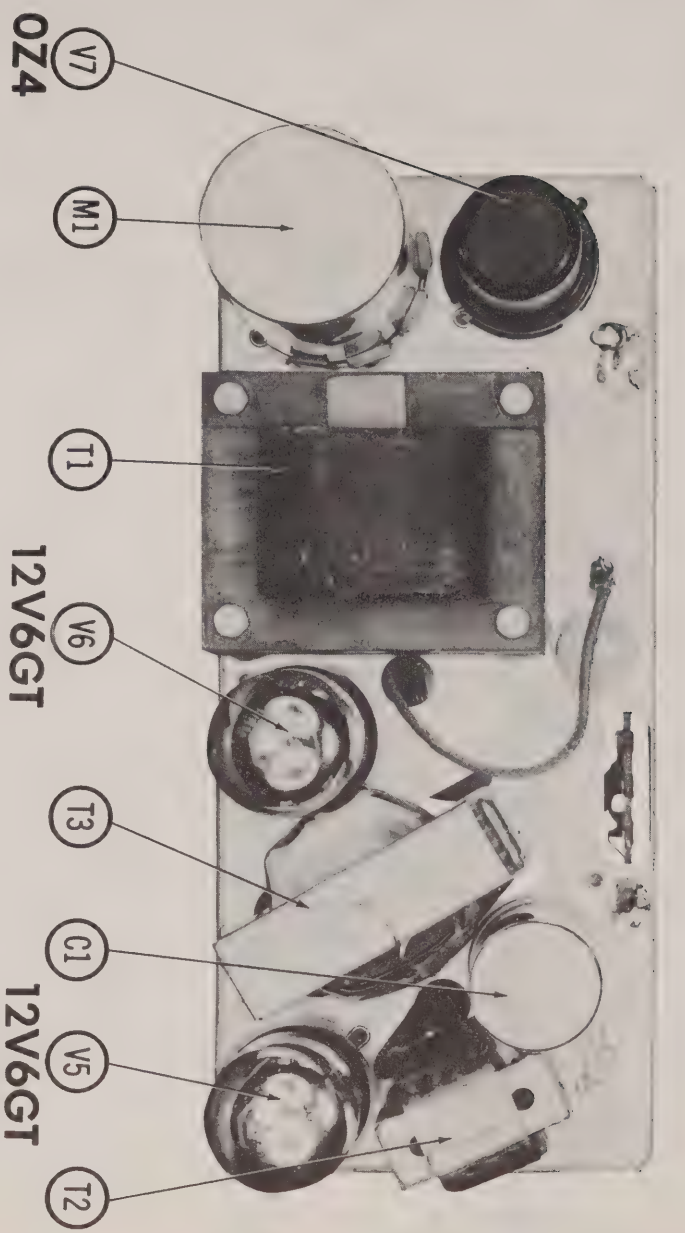
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6"x9"	PM	3-4Ω	7267838	69A2	238S1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DELCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	.6Ω		7255738	19-1004		4610	7 Microhenries
L2	Ant. Coil	10Ω		7258914				
L3	RF Choke	4.6Ω		7240251	19-6022		4626	25 Microhenries
L4	RF Coil	10Ω		7258914				
L5	Osc. Coil	1.3Ω	4.8Ω	7260499				
L6	Input IF	44Ω	44Ω	1219508	16-6752	BC-350	12-H1	
L7	Output IF	35Ω	35Ω	1218726	16-6754	BC-354	12-H6	
L8	Fil. Choke	0Ω		1217846				1.4 Microhenries
L9	Fil. Choke	0Ω		1217846				1.4 Microhenries
L10	Vib. Hash Choke	.1Ω		7267459				42 Microhenries

POWER SUPPLY – TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				DELCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115Ω	7265528	6330	G883	6330	

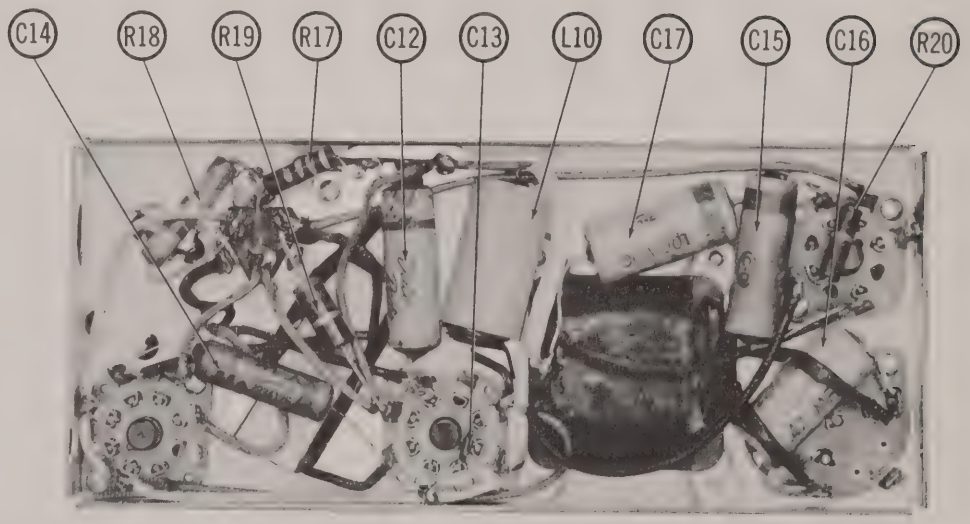
FUSES

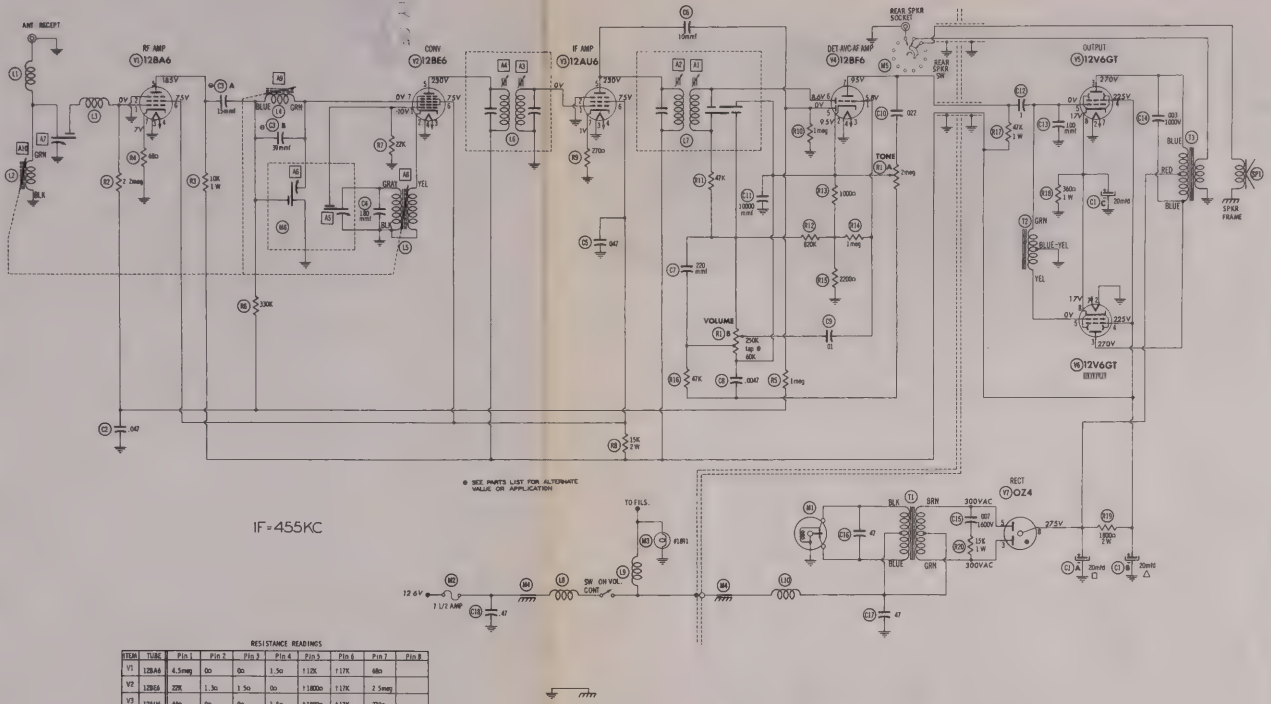
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		7.5A	455640	153R	30307.5 (7AG 7 1/2A)		SFE 7 1/2	

MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M3	Dial Light		#1891
M4	Spark Plate	1220682	
M5	Switch	7267402	Rear Speaker (Rotary, Wafer Type)
M6	Trimmer Cap.	7242454	Dual Trimmer: Osc. (A5), RF (A6)
A7	Trimmer Cap.	7267443	Ant.
	Knob	7267414	On-Off-Volume & Tuning
	Knob	7267412	Tone & Rear Speaker
	Dial	7267426	
	Pointer Assy.	7267431	
	Pushbutton & Slide	7267793	5 Used

POWER SUPPLY – BOTTOM VIEW





● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12BA6	4.5meg	0Ω	0Ω	1.5Ω	↑12K	↑17K	68Ω	
V2	12BE6	22K	1.3Ω	1.5Ω	0Ω	↑18000Ω	↑17K	2.5meg	
V3	12AU6	44Ω	0Ω	0Ω	1.5Ω	↑18000Ω	↑17K	270Ω	
V4	12BF6	1meg	3200Ω	1.5Ω	0Ω	1meg	250K	↑50K	
V5	12V6GT	NC	0Ω	↑195Ω	↑18000Ω	930Ω	NC	1.5Ω	360Ω
V6	12V6GT	NC	0Ω	↑215Ω	↑18000Ω	1100Ω	NC	1.5Ω	360Ω
V7	0Z4	TP	NC	230Ω	NC	250Ω	NC	TP	15K

↑ MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION
TP TIE POINT

1. DC voltages measured with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom view.
3. Measured values are from socket pin to chassis negative.
4. Battery voltage maintained at 12.6volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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TRAV-LER MODEL 517-107 (Ch. 520BD5)

TRADE NAME	Trav-Ler Models 517-106, 517-107, 521-111, 521-112 (Ch. 520B5, 520BD5)
MANUFACTURER	Trav-Ler Radio & Television Corp., 571 W. Jackson Blvd., Chicago 6, Ill.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC-60 Cycle or DC — RATING 1.1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)

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TRAV-LER MODELS 517-106, 517-107, 521-111, 521-112 (Ch. 520B5, 520BD5)

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TRAV-LER MODELS 517-106, 517-107, 521-111, 521-112 (Ch. 520B5, 520BD5)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs from side panel of cabinet.

2. Remove 2 wood and 1 metal screw. Remove rear cover.

3. Disconnect speaker leads, yoke plug, picture tube socket, HV lead and ground lead to picture tube bracket.

4. Remove 3 chassis bolts. Remove chassis.

5. Remove 4 speaker nuts. Remove speaker.

CABINET REMOVAL (For safety glass cleaning)

1. Remove 5 push-on type control knobs from side panel of cabinet.

2. Remove 2 wood screws and 1 metal screw . Remove rear cover.

3. Disconnect speaker leads.

4. Remove only the cabinet mounting bolts, which are identified by painted heads.

5. Lift cabinet from mounting board.

MODELS	CHASSIS
517-106, 517-107, 521-111, 521-112	520B5, 520BD5

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove cabinet. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control at the center of its range and adjust the horizontal frequency coil (L13) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L12) located on top of the chassis.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

TRAV-LER MODELS 517-106, 517-107, 521-111, 521-112 (Ch. 520B5, 520BD5)

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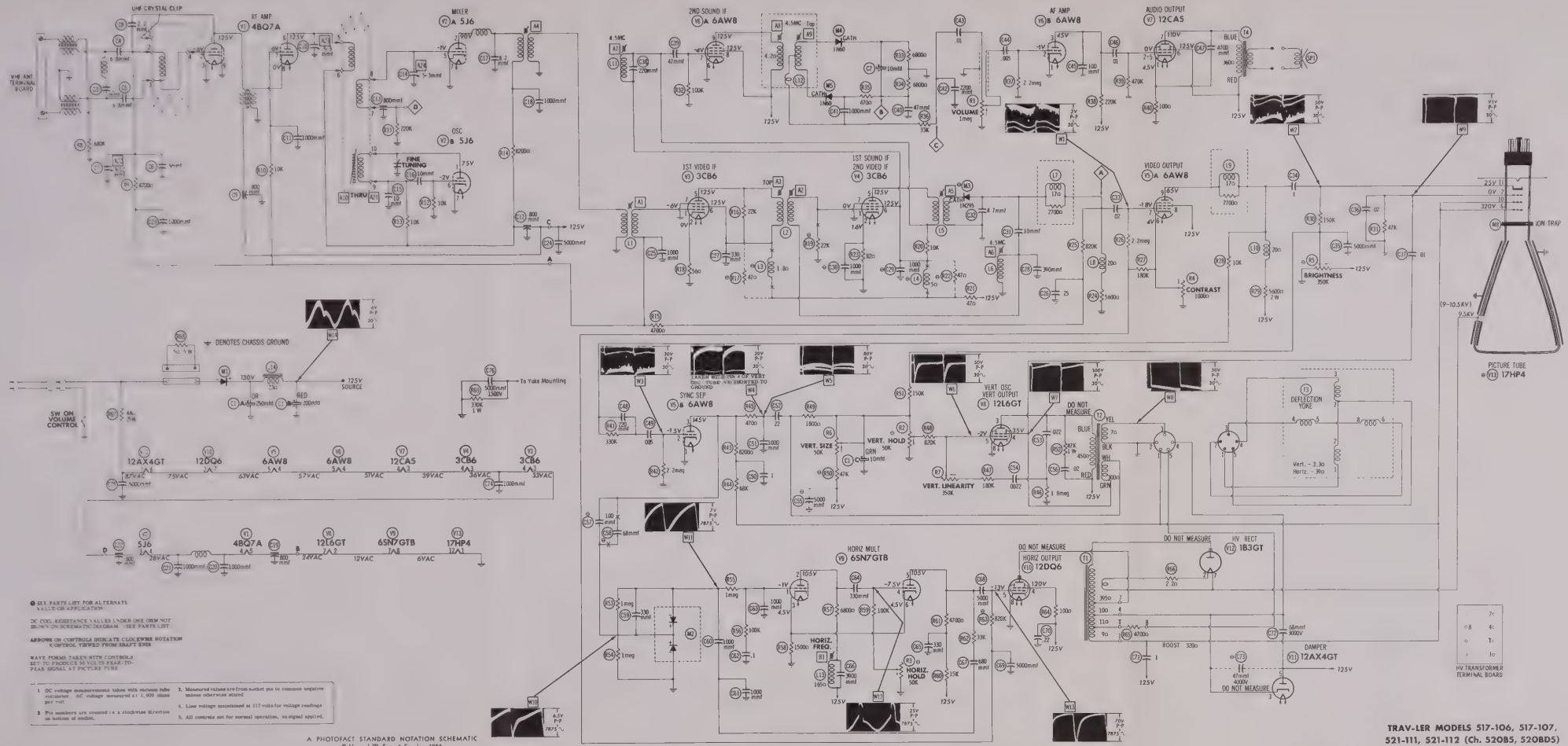
TRAV-LER MODELS 517-106, 517-107,
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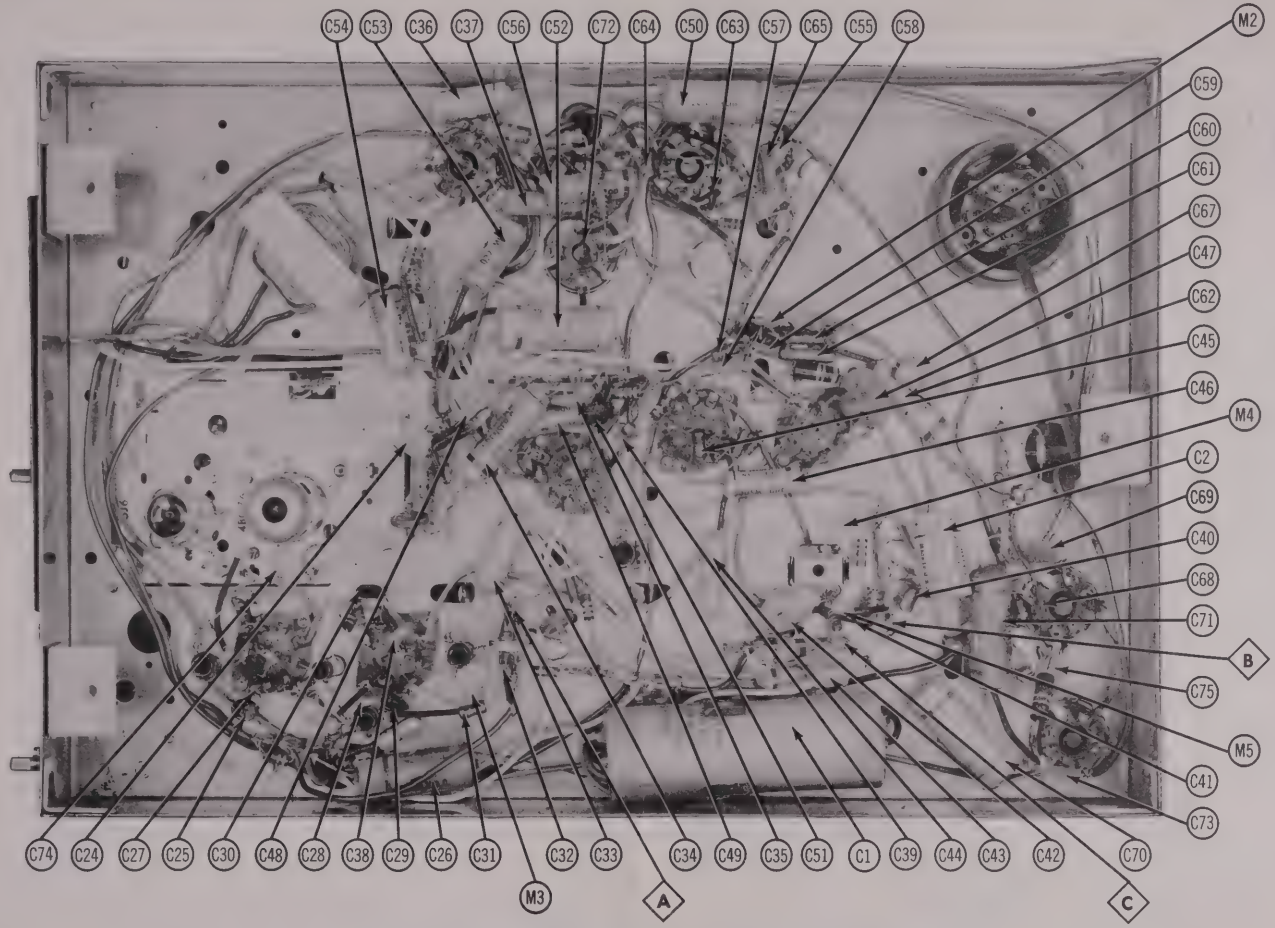
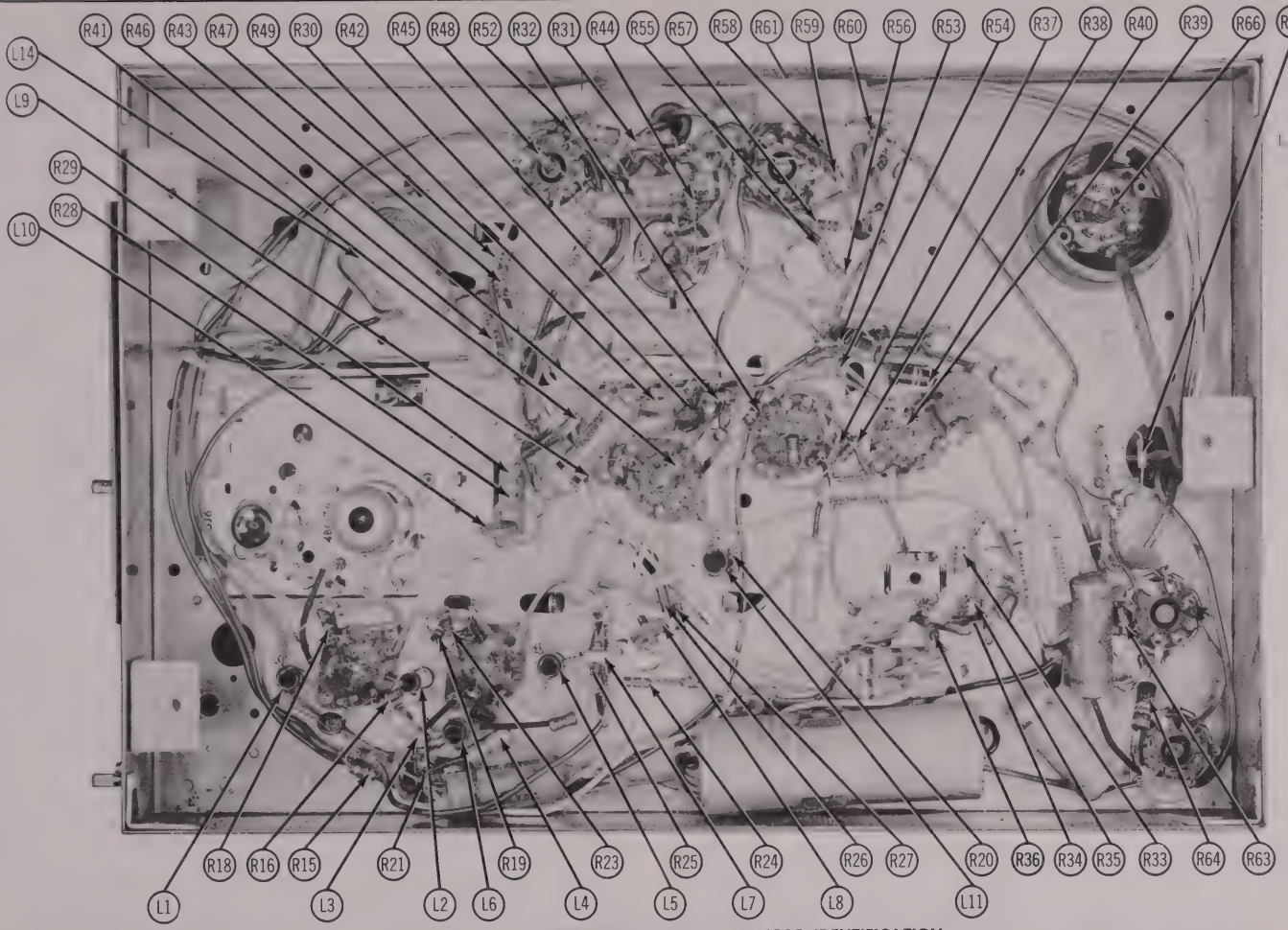
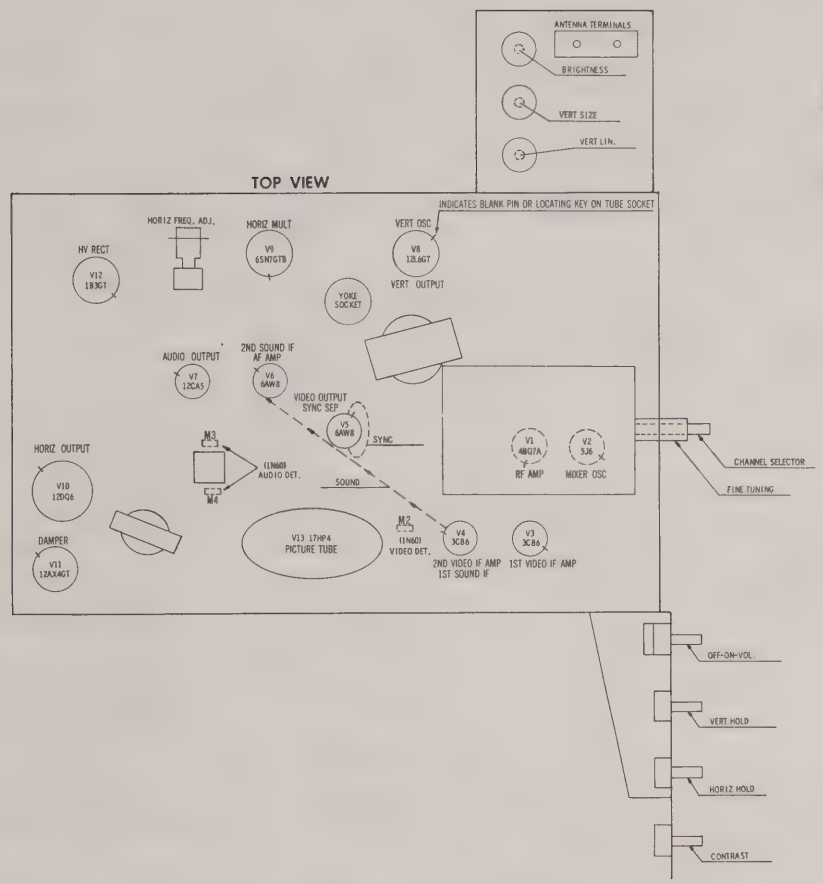


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

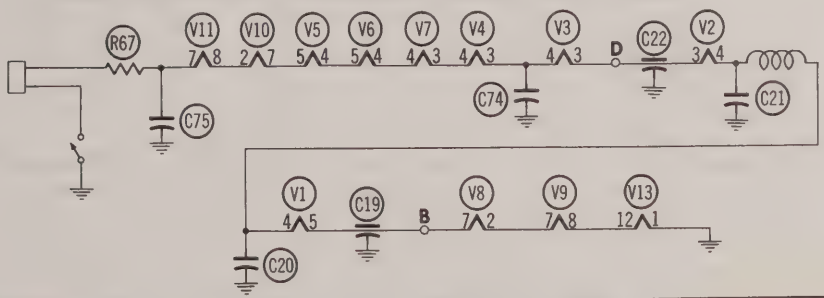
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifier (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V5, V13
Has pic, no sound - V4, V6, V7

SYNC FAILURE
No vert. sync - V5, V8
No horiz. sync - V5, V9
No vert. or horiz. sync - V5

SWEEP FAILURE
No raster, has sound - V9, V10, V11, V12, V13
No vertical deflection - V8
Poor vert. linearity or foldover - V8
Poor horiz. linearity or foldover - V9, V10, V11
Narrow picture - V9, V10, V11, V12, M1
Vert. off freq. - V5, V8
Horiz. off freq. - V5, V9

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See Circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube (V9) to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C30.
Connect the positive lead to chassis. Remove the converter tube (V2) from its socket and replace with a 5J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 3CB6 (V3). Low side to chassis.	24MC (10MC Swp)	21.75MC 26.25MC	Any	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Adjust A1 thru A5 to obtain response similar to Fig. 1. A1 and A2 affects the low frequency side of the response curve and A3 and A4 affects the high frequency side. Adjust A5 for proper symmetry flatness and bandwidth.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
2.	Direct	Connect high side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A6, A7, A8	Adjust for maximum deflection.
3.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Direct	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A6, A7, A8	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
3.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A9	Reconnect C2. Adjust so that 4.5MC falls at center of crossover lines as in Fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 5J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the left and below the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point Ⓐ. Low side to chassis.	A10	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A11	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A13	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A14	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A15	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A16	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A17	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A18	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A19	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A 21	

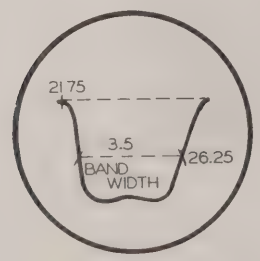


FIG. 1

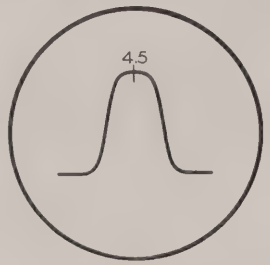


FIG. 2

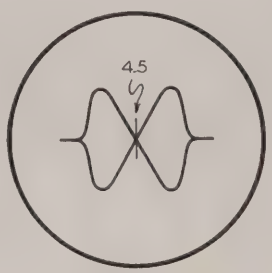


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point ◇D◇. Low side to chassis.	A22, A23, A24	Adjust for response curve similar to Fig. 5 with markers above 90%.
6.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustments of A22, A23 and A25 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

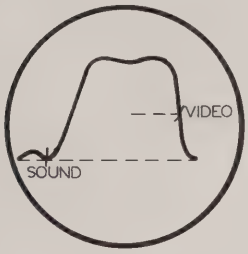


FIG. 4

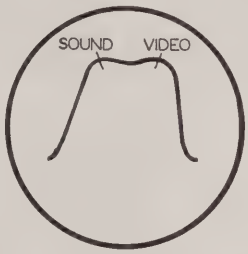
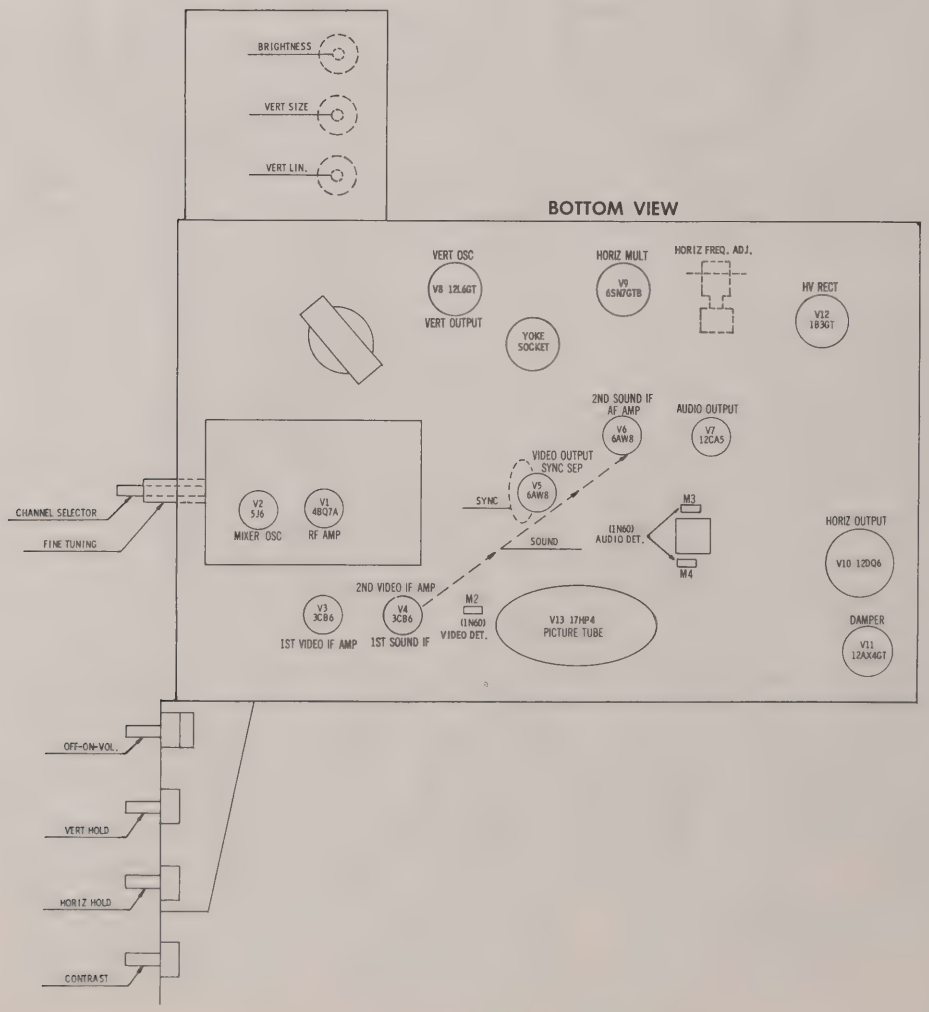


FIG. 5

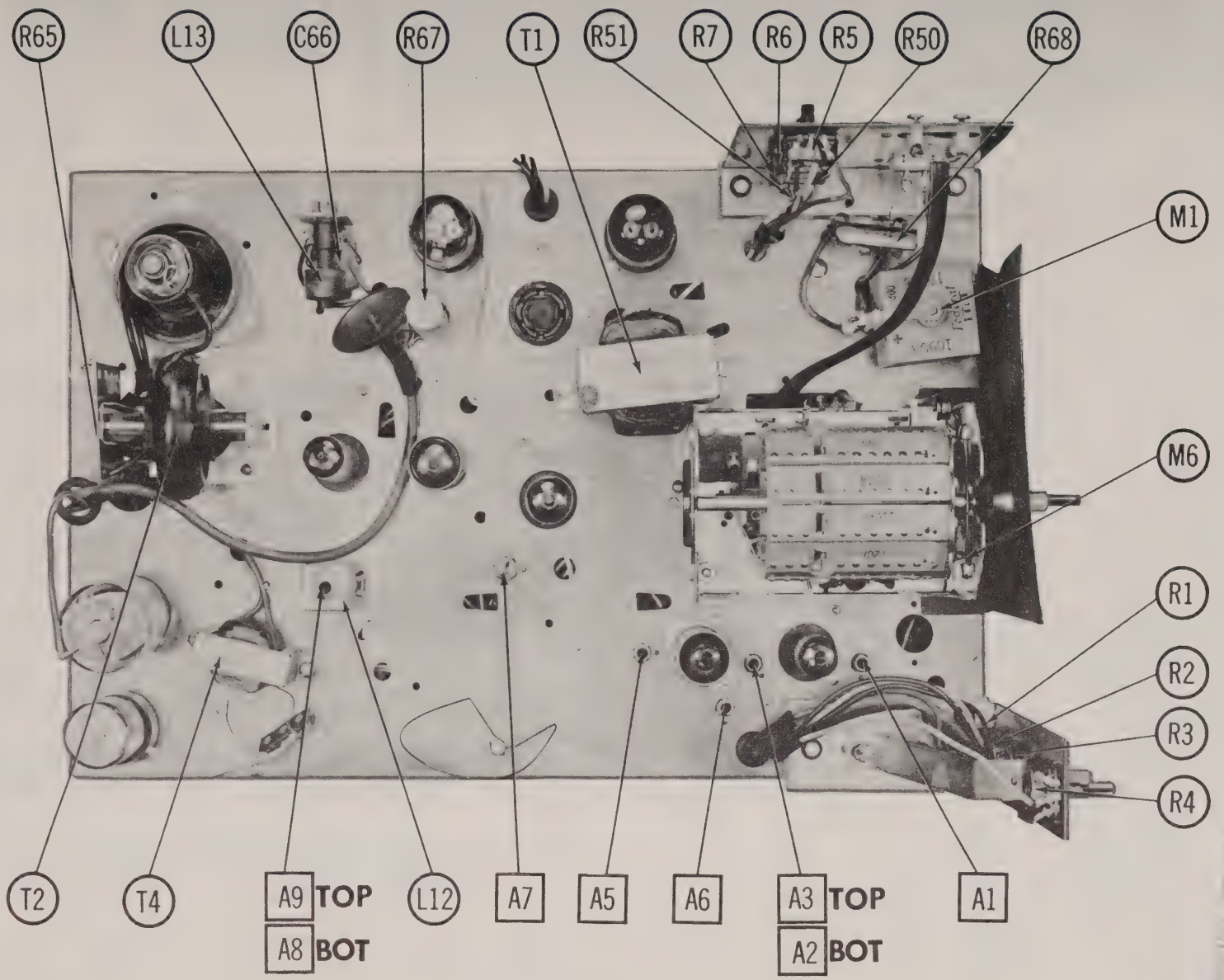
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BQ7A	† 23Ω	830K	0Ω	8Ω	6Ω	† 23Ω	830K	0Ω	0Ω
V2	5J6	† 10K	† 8200Ω	9Ω	8Ω	220K	10K	0Ω		
V3	3CB6	830K	56Ω	9Ω	10Ω	† 70Ω	† 70Ω	0Ω		
V4	3CB6	.9Ω	82Ω	10Ω	11Ω	† 70Ω	† 70Ω	0Ω		
V5	6AW8	0Ω	2.2Meg	▲ 75K	14Ω	15Ω	● 55Ω	2.2Meg	† 23Ω	† 5600Ω
V6	6AW8	0Ω	2.2Meg	† 220K	12Ω	14Ω	0Ω	100K	† 23Ω	† 23Ω
V7	12CA5	100Ω	470K	11Ω	12Ω	470K	† 23Ω	† 380Ω		
V8	12L6GT	TP	3Ω	† 470Ω	● † 30K	800K	TP	6Ω	0Ω	
V9	6SN7GTB	1.5Meg	† 6800Ω	1500Ω	● 130K	† 20K	1500Ω	3Ω	2Ω	
V10	12DQ6	NC	17Ω	NC	† 125Ω	1Meg	TP	15Ω	0Ω	TOP CAP ▲ 10Ω
V11	12AX4GT	NC	NC	INF	NC	† 23Ω	NC	20Ω	17Ω	
V12	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲ 405Ω
V13	17HP4	0Ω	47K	PIN 6 12Ω	PIN 10 12Ω	PIN 11 ● † 200K	PIN 12 2Ω			

† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V11.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
TP TIE POINT
NC NO CONNECTION.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW

PROPERTY OF KENSHIP

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	VHF RF Amplifier	4DQ7A	
V2	VHF Mixer-Oscillator	6JA	
V3	1st Video IF Amplifier	3CB6	
V4	2nd Video IF Amplifier-1st Sound IF Amplifier	3CB6	
V5	Video Output-Sync Sep	6AW8	
V6	2nd Sound IF Amplifier-AF Amplifier	6AW8	
V7	Audio Output	1BC8A	
V8	Vert. Osc.-Vert. Output	1ELSGT	
V9	Horiz. Mult.	6BN7GTB	
V10	Horiz. Output	1D0A	
V11	Damper	1BA2+GT	
V12	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: TRAV-LER PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V13	17HP4	17HP4-17RP4	17HP4-17RP4	17HP4	① Aluminized ② Silver screen "HS"
		17HP4B ①	17HP4B ①	17HP4B ① ②	
	21AUP4A ①	21AUP4A ①	21AUP4A ①		
			21AUP4A B ①	21AUP4A B ②	
	21AUP4				

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER PART No	AEROVOX PART No	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	250	150	TV-EC-39	PR3-012		WT950	CDB3015	D-065 T-985	RS284 *
B	300	150							
C	10	150							
C2	10	50	TV-EC-20	PR850V10	BR105	TC32	TD-10-50	FM-8510	TVA-1394

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	1			NPO-DI1	TC2-1	TZ03	NPOA-010			
C4	6.8			NPO-DI6.8	TC2-6R8	2013	NPOA-6R8	2T-5S6S	STCCB-V68	
C5	6.8			NPO-DI6.8	TC2-6R8	2013	NPOA-6R8	2T-5S6S	STCCB-V68	
C6	3			NPO-DI3	TC2-3	2007	NPOA-030	2T-S3S	STCCB-V33	
C7	3-12									
C8	3.3			NPO-SI2.3	TC2-3R3	2006	NPOA-2R2		STCCB-V32	
C9	800									
C10	5-3				S29-3		31S5-01-0R5	CT585A		
C11	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C12	800									
C13	800									
C14	.5-3				S29-3		31S5-01-0R5	CT568A		
C15	10									
C16	18			NPO-DI8.2		Z3I6	NPOA-8R2			
C17	8.2			BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C18	1000									
C19	800			BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C20	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C21	1000									
C22	1000			BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C24	5000		TV-CC-3	BPD-005	DD-502	KD80	801-005	DC-525	5HK-D5	
C25	1000		TV-CC-2	BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C26	.25	200	TV-PC-4	P288N-25		CUBP25		PT4625	2TM-P25	
C27	330		TV-CC-5	S330	DE-331	TP93	GPSK-331	UC-5333	5GA-T33	
C28	330		TV-CC-3	DI-0039	DD-391	C056	811-391	UC-5339	5GA-T39	
C29	1000		TV-CC-2	BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	Note 1
C30	1000		TV-CC-3	BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	Note 1
C31	10		TV-CC-31	S10	DE-100	TP69	831-100	UC-541	5GA-DI	
C32	4.7		TV-CC-15	NPO-SI4.7	TC2-4R7	NPOA-4R7	TZ65	2T-5547	5TCC-V47	
C33	.02	200	TV-PC-20	BPD-02	DF-203	CUBZ03	817-02	PT412	2TM-S2	
C34	.1	200	TV-PC-3	P288N-1	DF-104	CUBZP1		PT410	2TM-P1	
C35	5000		TV-CC-3	BPD-005	DD-502	KD80	801-005	DC-525	5HK-D5	
C36	.02	200	TV-PC-20	BPD-02	DF-203	CUBZ03	817-02	PT412	2TM-S2	
C37	01	600	TV-PC-15	BPD-01	DD-103	CUBZ01	GPS-333-103	PT611	2TM-61	
C38	220		TV-CC-44	S220	DE-221	TP39	GPSK-221	UC-5323	5GA-T22	
C39	47		TV-CC-12	S47	DE-470	TP39	GPSK-470	UC-5447	5GA-Q47	
C40	47		TV-CC-12	S47	DE-470	TP39	GPSK-470	UC-5447	5GA-Q47	
C41	1000		TV-CC-7	1464-001		SD-102		MCB255	MB-31	
C43	2200	500	TV-MC-12	1464-0022			1RSD23		MB-322	
C44	.01	400	TV-PC-7	BPD-01	DD-103	CUBZ01	GP3-333-103	PT411	2TM-61	
C45	.005	600	TV-PC-10	BPD-005	DD-503	CUBZD5	GP3-333-502	PT625	6TM-D5	
C46	100		TV-CC-5	S100	DE-101	TP94	GPSK-101	UC-531	5GA-T1	
C47	.01	400	TV-PC-7	BPD-01	DD-103	CUBZ01	GP3-333-103	PT411	2TM-61	
C48	4700		TV-CC-35	BPD-0047	DD-472	K079		UC-5347	5HK-D47	
C49	330	500	TV-MC-11	S330	DE-331	TP93	GPSK-331	UC-5333	5GA-T33	
C50	.005	400	TV-PC-10	BPD-005	DD-502	CUBD5	GP3-333-502	PT625	6TM-D5	
C51	.1	600	TV-PC-18	P688N-1	DF-104	CUBZP1		PT601	6TM-P1	
C52	1000		TV-CC-3	BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C53	.22	200	TV-PC-25	P288N-22		CUBZP23		PT4022	2TM-P22	
C54	.022	200	TV-PC-23	BPD-03	DF-303	CUBZ03	817-03	PT4123	2TM-S23	
C55	.0022	600	TV-PC-24	DI-0022	DE-222	CUBZD22	GP3-333-222	PT6322	6TM-D22	
C56	5000		TV-CC-3	BPD-005	DD-502	KD80	801-005	DC-525	5HK-D5	Note 1
C58	.02	600	TV-PC-14	BPD-02	DF-203	CUBZ6S	817-02	PT612	6TM-S2	
C59	100			NPO-S100	DE-101	TZ30	861-001	MC255	MB-31	Note 2
C60	68	500	TV-MC-21	NPO-S68	DE-680	1ZBK6Q68	831-680		MB-468	Note 2
C59	330	500	TV-MC-15	1469-00033	DE-331	1RS723	831-331		MB-333	
C60	1000		TV-CC-7	1464-001		SD-102	1RSD1	801-103	MCB255	
C61	1000		TV-CC-7	1464-001		SD-102	1RSD1	801-103	MCB255	MB-31
C62	.1	200	TV-PC-3	P288N-1	DF-104	CUBZP1		PT401	2TM-P1	
C63	1000		TV-CC-2	BPD-001	DD-102	KD69	801-001	DC-521	5HK-DI	
C64	330		TV-MC-13	1469-00033	DE-331	1RS723	831-331		MB-333	
C65	330		TV-MC-13	1469-00033	DE-331	1RS723	831-331		MB-333	
C66	3900	500	TV-MC-12	1464-0039			1RSD39	831-881	MCB663	MB-339
C67	680	500	TV-MC-16	1464-00068		D6-881	1RS768			MB-368
C68	5000		TV-CC-3	BPD-005	DD-502	KD80	801-005	DC-525	5HK-D5	
C69	5000		TV-CC-3	BPD-005	DD-502	KD80	801-005	DC-525	5HK-D5	
C70	.33	200	TV-PC-35	P288N-33			CUBZP23		PT4033	
C71	.1	600	TV-PC-15	P688N-1		DF-104	CUBZP1		PT601	6TM-P1
C72	68	3000	TV-CC-41	HVD-30-68		DD30-680	V3Q68	5KV-680	DC30468	30GA-Q68
C73	47	4000		HVD-40-47			V3Q47			50GA-Q47 Note 3
C74	1000		TV-CC-2	BPD-001		DD-102	KD69	801-001	DC-521	5HK-DI

CAPACITORS (cont)

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C75	5000		TV-CC-3	BPD-005	DD-502	KD80				
C76	5000	1000	TV-CC-40	HVD-15-4700	DD15-502	V3D5	1RSKV-472	DC-535	5HK-D5 20BK-D5	

Note 1. Some versions use a dual unit (part #TV-CC-2) in this application.
Note 2. When C57 is a 150MMF unit, C56 is not used.
Note 3. Used on 21" models only.
Note 4. Not used in some versions

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER Part No.	CENTRALAB Part No.	CARTAFAT Part No.	IRC Part No	MALLORY Part No	INSTALLATION NOTES
R1A	1Meg	½	TV-VC-51	AB-7D	A47-1Meg-S	Q13-127	U53	Volume
B	Shaft		Not Req.	AK-4	KM-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KD-1	TS-1	UB -38	Not Req.	Attach to R1A
R2A	50K	½	VC-72	AB-31	A47-50K-S	Q11-123	TA54L	Vert Hold - Note 1
B	Shaft		Not Req.	AK-4	KM-3	Not Req.	Not Req.	Attach to R2A
R3A	50K	½	VC-72	AB-31	A47-50K-S	Q11-123	TA54L	Horiz. Hold - Note 2
B	Shaft		Not Req.	AK-4	KM-3	Not Req.	Not Req.	Attach to R3A
R4A	2000	½	VC-61	AB-5	A47-1000-S	Q11-106	TA3L	Contrast
B	Shaft		Not Req.	AK-6	KM-3	Not Req.	Not Req.	Attach to R4A
R5A	250K	½	VC-74	AB-39	A47-250K-S	Q11-133	TA55L	Brightness - Note 3
B	Shaft		Not Req.	AK-1	RM-3	Not Req.	Not Req.	Attach to R5A
R6A	50K	½	VC-73	AB-31	A47-50K-S	Q11-123	TA54L	Vert. Size
B	Shaft		Not Req.	AK-1	RM-3	Not Req.	Not Req.	Attach to R6A
R7A	250K	½	VC-74	AB-39	A47-250K-S	Q11-133	TA55L	Vert. Linearity
B	Shaft		Not Req.	AK-1	RM-3	Not Req.	Not Req.	Attach to R7A

Note 1. Some versions may use an alternate control part #VC-72A in this application.
Note 2. Some versions may use an alternate control part #VC-72B in this application.
Note 3. Some versions may use an alternate control part #VC-74B in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: TRAV-LER Part No.	IRC Part No.	NOTES
R8	680K			BTS-680K	
R9	4700Ω			BTS-4700	
R10	10K			BTS-10K	
R11	220K			BTS-220K	
R13	10K			BTS-10K	
R14	8200Ω			BTS-8200	
R15	4700Ω		TV-IR-48	BTS-4700	
R16	22K		TV-IR-45	BTS-22K	
R17	470		TV-IR-97	BTS-47	Note 1
R18	56Ω		TV-IR-103	BTS-56	
R19	22K		TV-IR-45		Note 1
R20	10K		TV-IR-84	BTS-10K	
R21	470		TV-IR-97	BTS-47	Note 1
R23	470		TV-IR-97	BTS-47	
R23	82Ω		TV-IR-78	BTS-68	
R24	56000		TV-IR-52	BTS-5600	
R25	82K		TV-IR-116	BTS-820K	
R28	2 1Meg		TV-IR-13	BTS-2 1Meg	
R27	180K		TV-IR-115	BTS-180K	
R28	10K		TV-IR-84	BTS-10K	
R29	56000	2	TV-IR-123	BTS-5600	
R30	150K		TV-IR-80	BTS-150K	
R31	47K		TV-IR-68	BTS-47K	
R32	100K		TV-IR-83	BTS-100K	
R33	68000		TV-IR-78	BTS-68000	
R34	56000		TV-IR-52	BTS-5600	
R35	470Ω		TV-IR-6	BTS-470	
R36	33K		TV-IR-58	BTS-33K	
R37	2.2Meg		TV-IR-14	BTS-2.2Meg	
R38	220K		TV-IR-91	BTS-220K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: TRAV-LER Part No.	IRC Part No.	NOTES
R39	470K		TV-IR-11	BTS-470K	
R40	100Ω		TV-IR-106	BTS-100	
R41	330K 5%		TV-IR-12	BTS-330K	
R43	2.2Meg		TV-IR-13	BTS-2.2Meg	
R43	8200Ω		TV-IR-113	BTS-8200	
R44	68K		TV-IR-61	BTS-68K	
R45	470Ω		TV-IR-6	BTS-470	
R46	1.5Meg		TV-IR-119	BTS-1 5Meg	
R47	180K		TV-IR-115	BTS-180K	
R48	820K		TV-IR-116	BTS-820K	
R49	1800Ω		TV-IR-122	BTS-1800	
R50	47K		TV-IR-46	BTS-47K	Note 2
R51	150K		TV-IR-95	BTS-150K	
R52	47K	1	TV-IR-130	BTA-47K	
R53	1Meg 5%		TV-IR-109	BTS-1Meg	
R54	1Meg 5%		TV-IR-105	BTS-1Meg	
R55	1Meg		TV-IR-13		
R56	10K		TV-IR-43		
R57	68000		TV-IR-129		
R58	1500Ω 5%		TV-IR-29		
R59	100K		TV-IR-83		
R60	15K		TV-IR-63		
R61	4700Ω		TV-IR-48		
R63	15K		TV-IR-58		
R65	820K		TV-IR-116		Note 3
R64	100Ω		TV-IR-106		
R65	4700Ω		TV-IR-48		
R66	2 2Ω		TW-WR-21	SW§-2 2	
R67	44Ω	25	TV-WR-20		
R68	5Ω	5	TV-F-6		
R69	330K	1	TV-IR-124	BTA-330K	

Note 1 Not used in some versions.
Note 2 In chassis using 21" picture tube, a 27K resistor is used in this application (Part #TV-IR-82)
Note 3. Later production models use a 680K resistor in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No	Hallodorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T1	Vert.Osc. & Output Trans.	TV-TR-18								
T2	Horiz.Output Trans.	TV-TR-19	FB41P ①	HVO-36 * ①	225T1 * ①	X094 * ①	A-8280 * ①	FLY-16 *§ ①	D-50 * ①	
T3A	Yoke-Horiz. (55MM)	TV-LC-80	DP80②	MDP-74②	S14D1 ②	YT02W3/3 ②	DY-10A ②	Y-11 ③	Y-30 ③	
3B	Vert.(3-7MM)									

* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.
① Drill new mounting hole(s).
② Requires new centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Hallodorson Replacement Connections	Merit Replacement Connections	RCA Rem Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7	9	9	9	9	3	9	9
4	7	7	7	7	3	7	7
T	NC See Note ③	NC See Note ③	NC See Note ③	NC See Note ③	NC See Note ③	NC See Note ③	NC See Note ③
1	1	1	1	1	1	1	1
Special Retrace	①	①	①	①	①	①	①

① Install damping network consisting of approx. 50-100MMF ⑤ 2KV and 1000Ω ⑤ ½W connected in series across terminals #3 and #7 of horizontal yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRAV-LER PART No.	Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T4	4.35KΩ	3-4Ω	AT-16	21U07	A-2930	A-3850	24S50	S-51X	

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: TRAV-LER PART No.	QUAM PART No.	RCA TYPE No	NOTES
SP1	5"	PM	3-4Ω	SPK-36	5A07	20S82	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: TRAV-LER PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	1st.Video IF	.3Ω	.8Ω	TV-L-63				
L2	2nd.Video IF	.6Ω	.4Ω	TV-L-51				
L3	RF Choke	1.8Ω		TV-L-58	19-1002		4606	2.2Microhenries, IRC part #CLA - Not used in some versions 1.5 Microhenries, IRC part #CLA - Not used in some versions
L4	RF Choke	8Ω		TV-L-59				
L5	3rd. Video IF	.6Ω	.8Ω	TV-L-67				
L6	1st.Sound IF	.6Ω		TV-L-66				
L7	Series Peaking Coil	17Ω		TV-L-66	19-3300 *	TV-190 *	6132 *	330 Microhenries, wound on 37K resistor
L8	Shunt Peaking Coil	20Ω		TV-L-65	19-3980		6148	680 Microhenries
L9	Series Peaking Coil	17Ω		TV-L-66	19-3300 *	TV-190 *	6132 *	330 Microhenries, wound on 37K resistor
L10	Shunt Peaking Coil	20Ω		TV-L-65	19-3980		6148	680 Microhenries
L11	2nd.Sound IF	.6Ω		TV-L-68				
L12	Ratio Det.	4.2Ω	1.5Ω	TV-L-17	17-3497	TV-115	6205	Tertiary winding - 7Ω

* Parallel with 37K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA: TRAV-LER PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	Triad PART No	NOTES
L13	165Ω		TV-L-64	19-1576	TV-163	6210			24S44	S-25X	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT 1000 Cps	REPLACEMENT DATA: TRAV-LER PART No.	Hallodorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No	NOTES
L14	270A	23Ω	6 HY		FC-3			28C44	C-23X	

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: TRAV-LER PART No	FEDERAL PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No	SARKES TARZIAN PART No	NOTES
M1	.270A	SR-5	1090A	MR300	66300	604	300	

SELENIUM DIODE

ITEM No	RATING: CURRENT	REPLACEMENT DATA: TRAV-LER PART No	FEDERAL PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No	SARKES TARZIAN PART No	NOTES
M2		SR-6 ①	1S15 ①	1T1 ①				① Two required

CRYSTAL DIODES

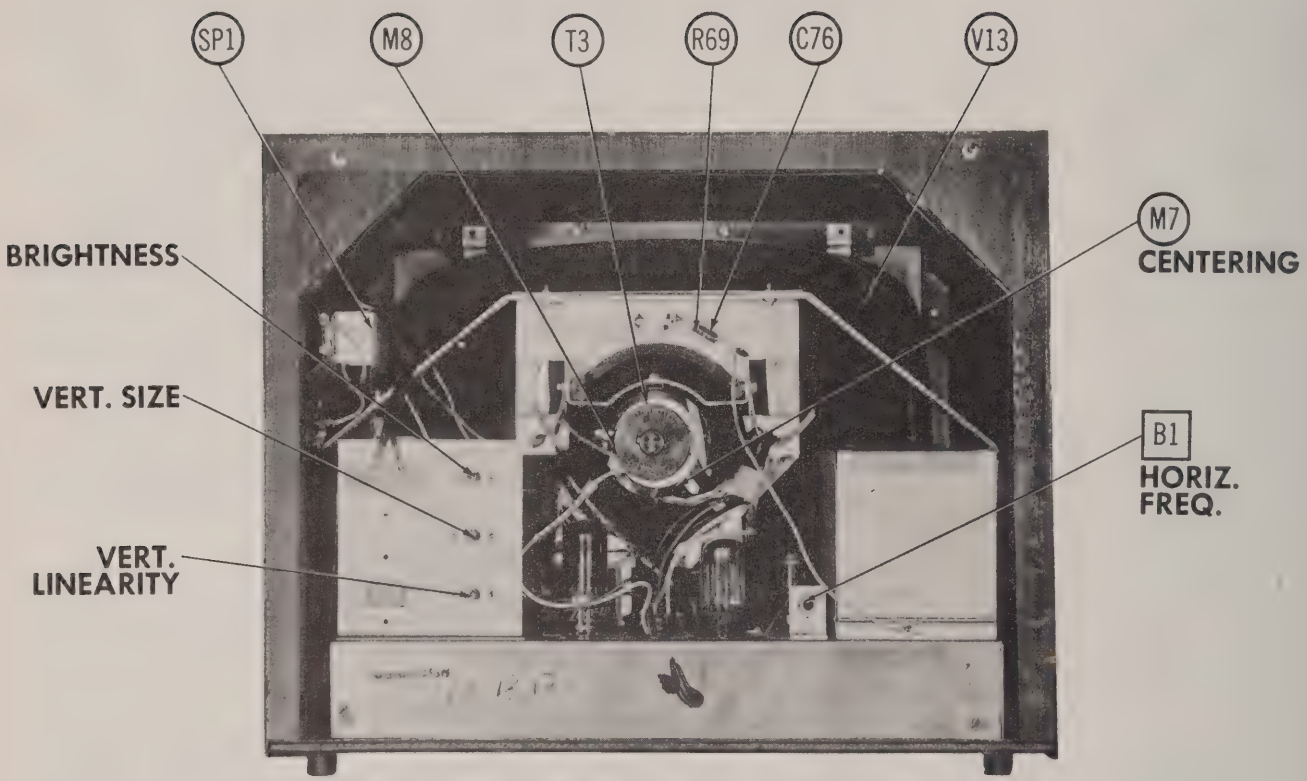
ITEM No.	ORIG. TYPE	REPLACEMENT DATA: TRAV-LER PART No.	SYLVANIA PART No.	NOTES
M3	1N295 *	TV-RC-1	1N60	Video Detector (Pigtail)
M4	1N60	TV-RC-1	1N60	Ratio Detector (Pigtail)
M5	1N60	TV-RC-1	1N60	Ratio Detector (Pigtail)

* Some versions may use crystal diode type 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M6	Tuner	TA-25	VHF
M7	Centering Device		Part of deflection yoke (T3) rear cover
M8	Ion Trap	TV-MA-7	
	Knob	TV-K-180	Fine tuning
	Knob	TV-K-161	Channel selector
	Knob	TV-K-168	On-off-volume, vert. hold, horiz. hold
	Knob	TV-K-189	On-off-volume, vert. hold, horiz. hold and Contrast
	Safety Glass	TV-DW-58	Models 517-106, 517-127
	Safety Glass	TV-DW-56	Models 521-111, 521-112
	Mask	TV-MP-49	Models 517-106, 517-707
	Mask	TV-MP-58	Models 521-111, 521-112

TRAV-LER MODELS 517-106, 517-107, 521-111, 521-112 (Ch. 520B5, 520B6)



CABINET—REAR VIEW

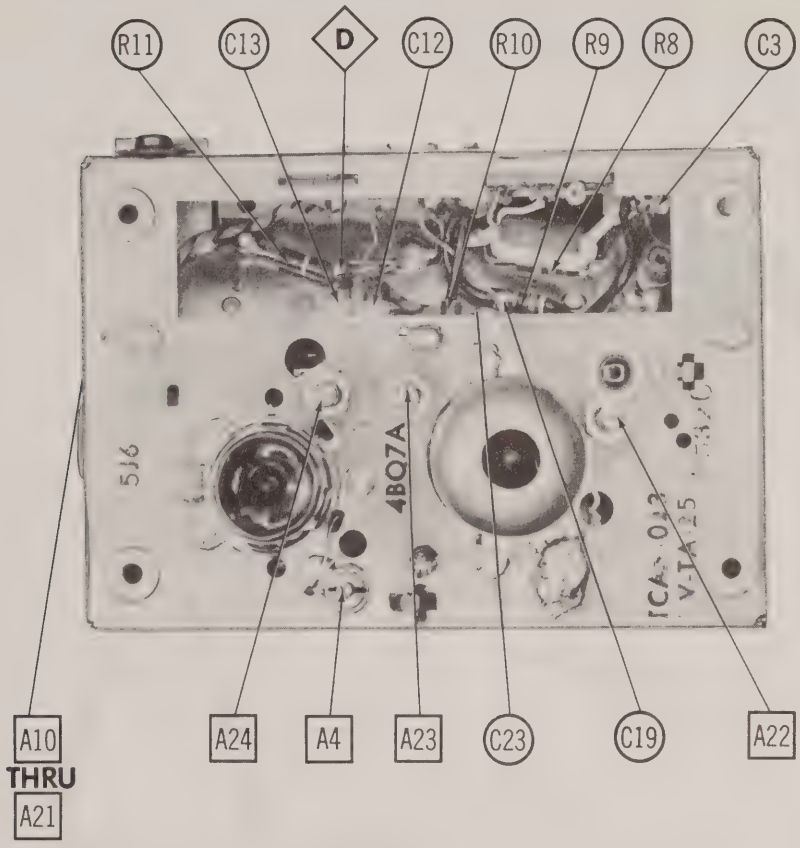
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

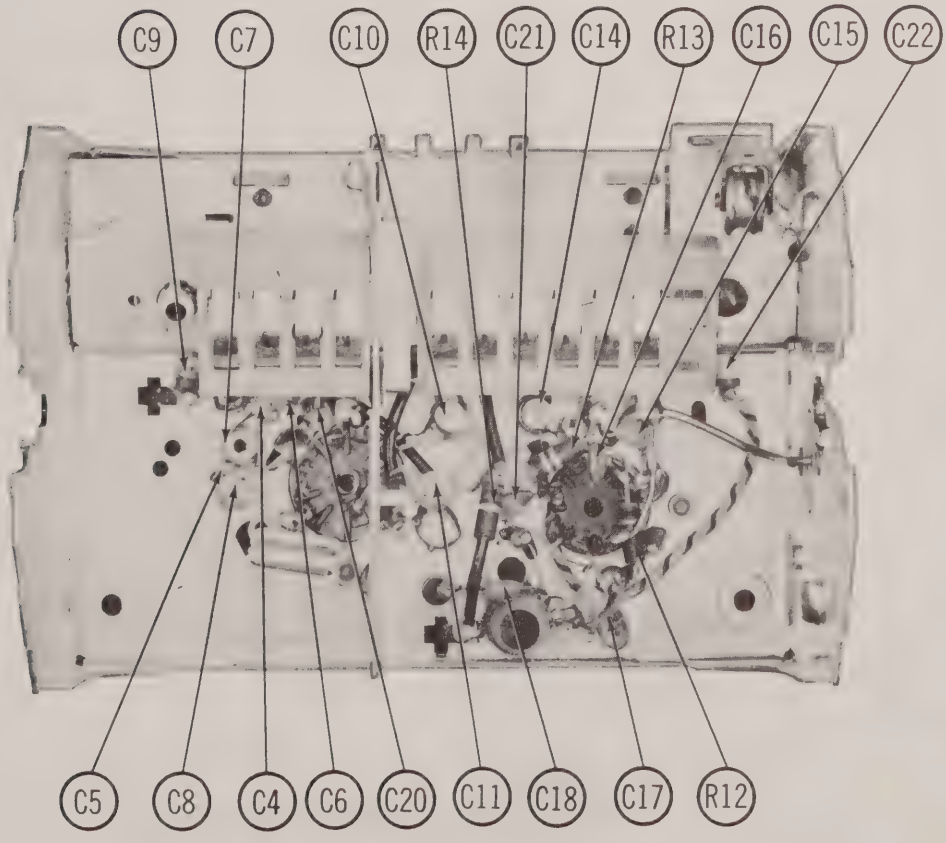
Set the horizontal hold control at the center of its range. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Momentarily remove the signal by switching off channel and back again.

If the picture does not pull into sync, retouch B1. Repeat this procedure until proper sync action is obtained.



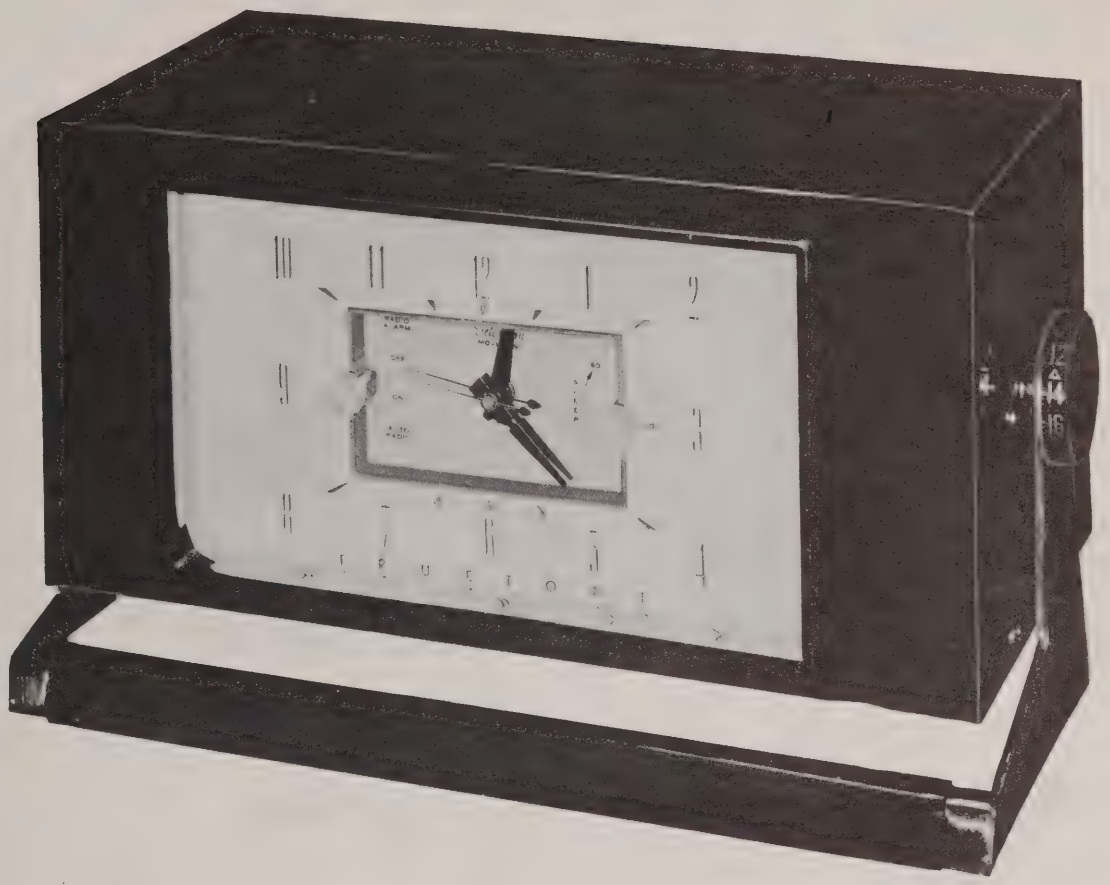
RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

TRUETONE
MODELS D2665A, D2666A

TRUETONE
MODELS D2665A, D2666A



TRUETONE
MODELS D2665A, D2666A

TRADE NAME	Truetone Models D2665A, D2666A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .29 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D2665A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	C402020-1.5	PRS150V40 F020	BBRT42215	TCT3114	TDLT-3	FMT-310	TVA-3448
B	20	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	C054	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	10			BPD-00001	DD-100	G018	831-100	UC-541	5GA-Q1	Note 1
C4A	220									
B	2000									
C	5000		♦PC150	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C5	5000		C0050	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C6	.05	400	C054	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C7	.1	400	C104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

Note 1. Not used in some versions.
♦ Items C4A, C4B, C4C, C4D, C4E, R5A, R5B and R5C are combined in one unit. When replacing items separately, C4D and C4E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VRT90	AB-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

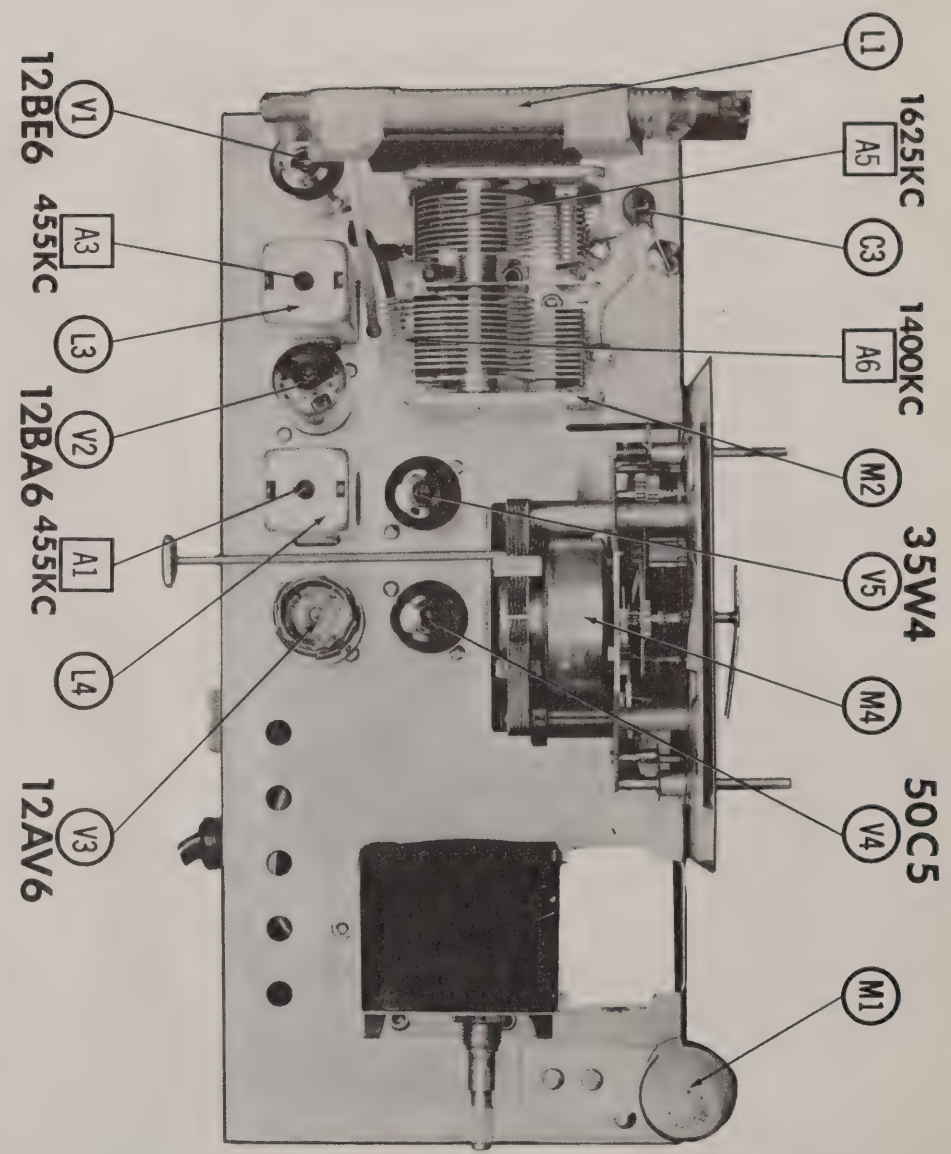
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	22K		R223.5	BTS-22K	
R3	120Ω			BTS-120	Note 1
R4	2.2Meg		R225.5	BTS-2.2Meg	
R5A	6.8Meg			BTS-6.8Meg	
B	470K		♦PC-150	BTS-470K	
C	470K			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R6	150Ω		R151.5	BTS-150	
R7	220Ω	1	R2211	BTA-220	
R8	1000Ω	1	R1021	BTA-1000	

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D, C4E are combined in one unit.
Note 1. Some versions use 270Ω in this application. (Part #R271.5).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3-4Ω	Part of Spkr. SPK-90	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	SPK-90	4A07	22381	

COILS (RF-IF)

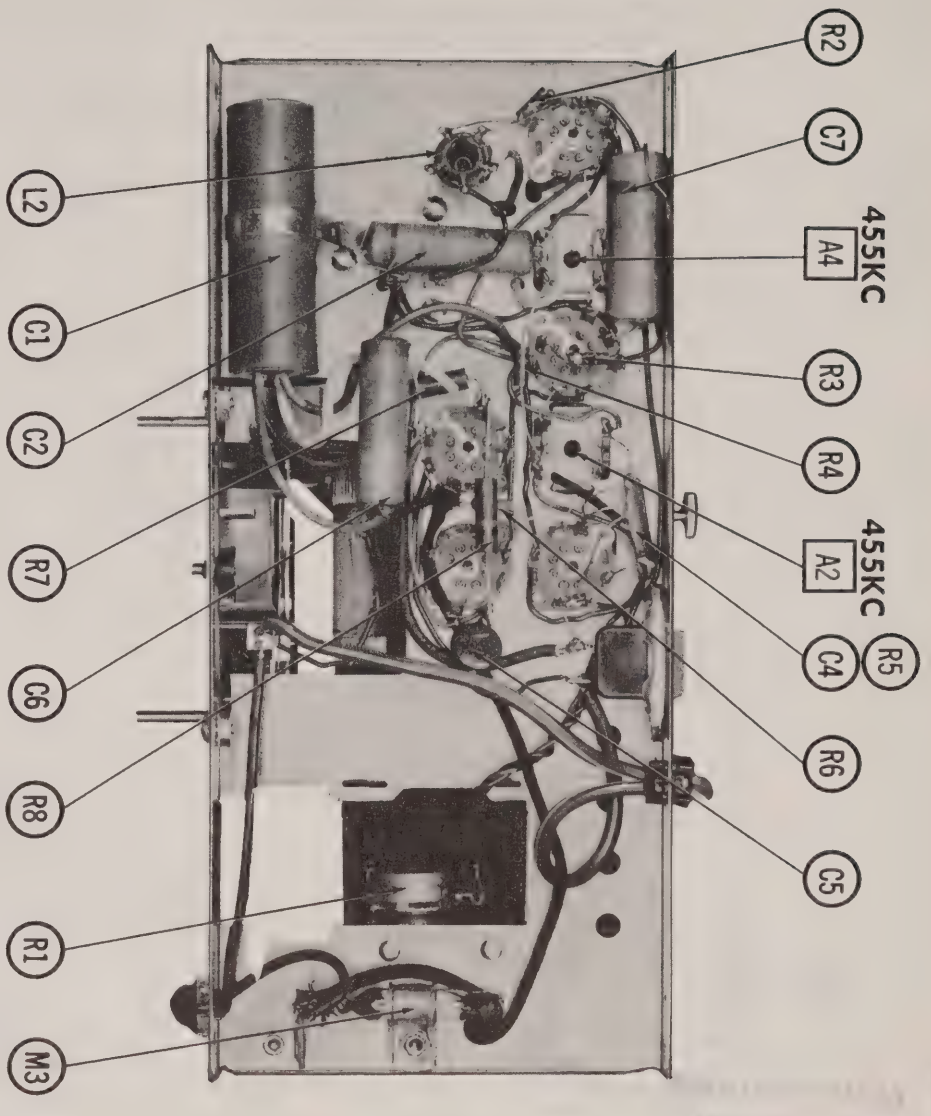
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	.9Ω		LT90				
L2	Osc. Coil	.4Ω	5.2Ω	LOT85	14-1073		69-OSC *	
L3	Input IF	18Ω	18Ω	LIFT67	16-6758	BC-352	12-C1	
L4	Output IF	18Ω	18Ω	LIFT67	16-6758	BC-353	12-C2	

* Drill mounting hole.

MISCELLANEOUS

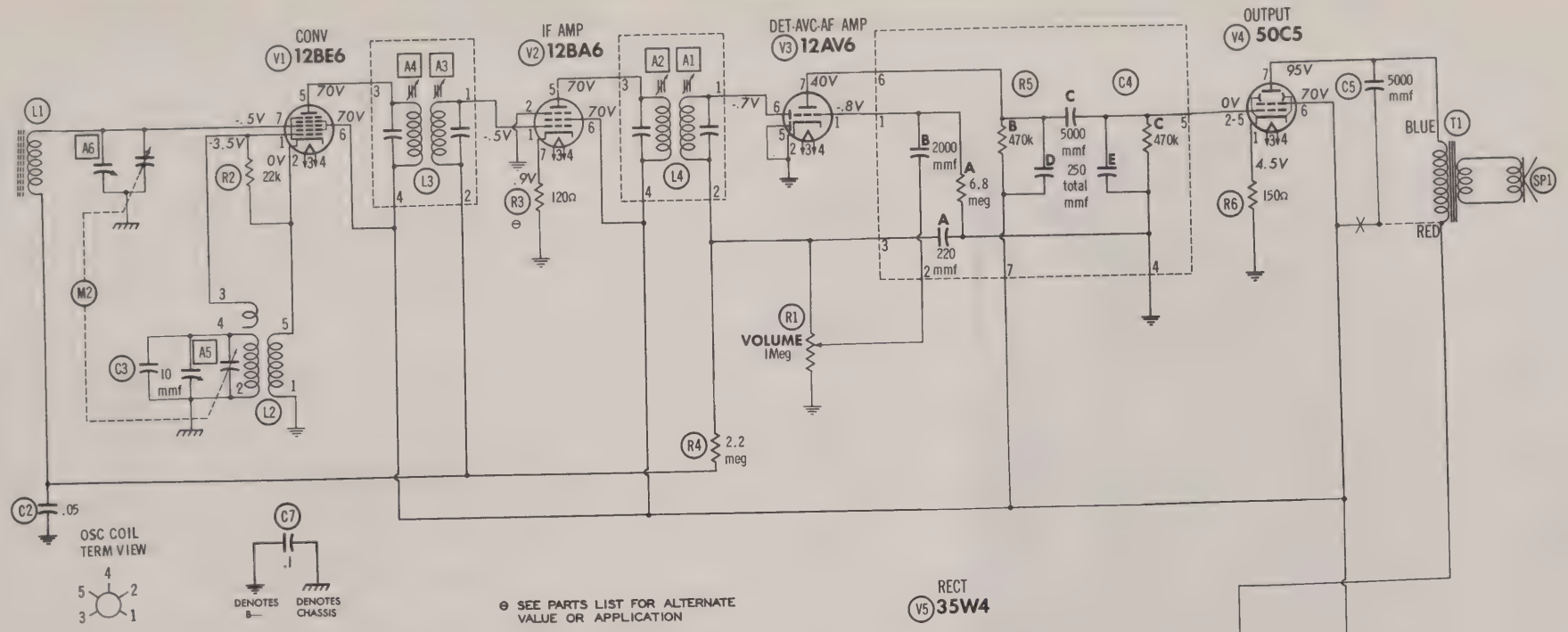
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Night Light		115-125V - 7W
M2	Tuning Cap.	VCT90	2 Gang (37-435MMF, 26-180MMF)
M3	Switch	A12M	Mercury (Night Light)
M4	Clock	C103	
	Cabinet	P-3000B	
	Knob	M2605	Tuning
	Knob	M2606	Volume
	Knob	M2608	Clock (2 used)
	Glass	M2607	Clock (2 used)

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2665A

TRUETONE MODEL D2665A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	24Ω	12Ω	†1200Ω	†1200Ω	3.2Meg
V2	12BA6	3.2Meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	120Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	1Meg	†470K
V4	50C5	150Ω	470K	86Ω	36Ω	470K	†1200Ω	†400Ω
V5	35W4	TP	NC	86Ω	120Ω	120Ω	115Ω	20K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

333-16

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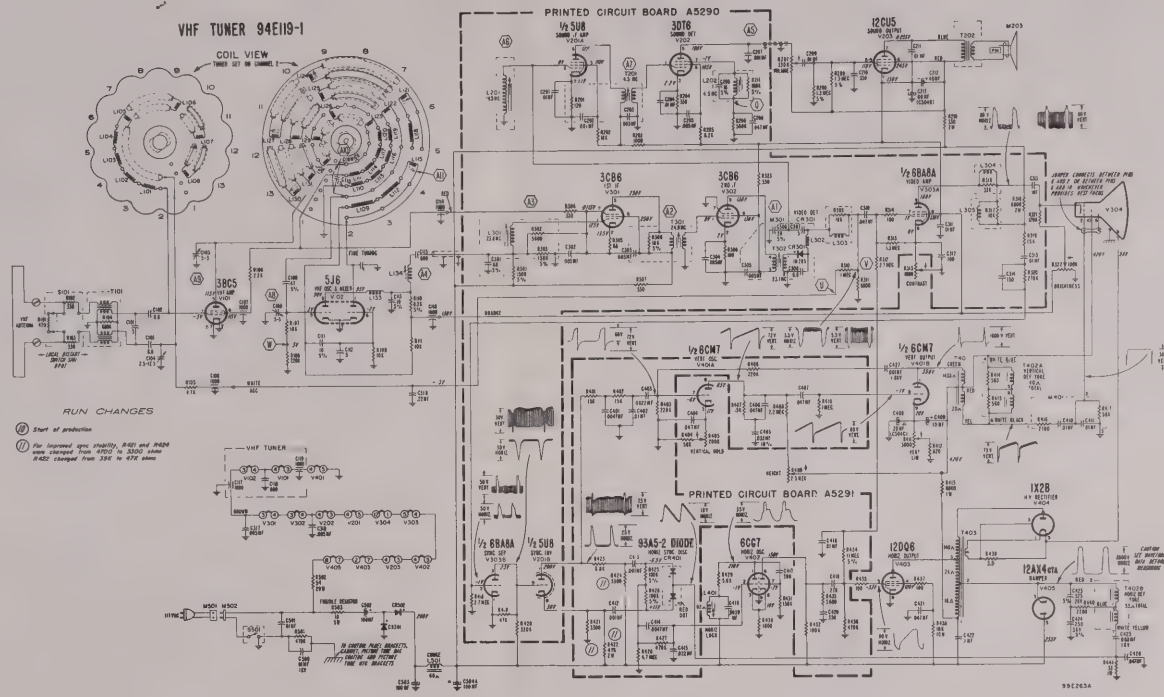
ADMIRAL MODELS
T101 (Ch.14YP3B)
T102 (Ch.14YP3B)
T103 (Ch.14YP3B)
T104 (Ch.14YP3B)
T105AL (Ch.14YP3B)
T106AL (Ch.14YP3B)
T107AL (Ch.14YP3B)
TS101 (Ch.14YP3B)
TS102 (Ch.14YP3B)
TS103 (Ch.14YP3B)
TS104 (Ch.14YP3B)
TS105AL (Ch.14YP3B)
TS106AL (Ch.14YP3B)
TS107AL (Ch.14YP3B)



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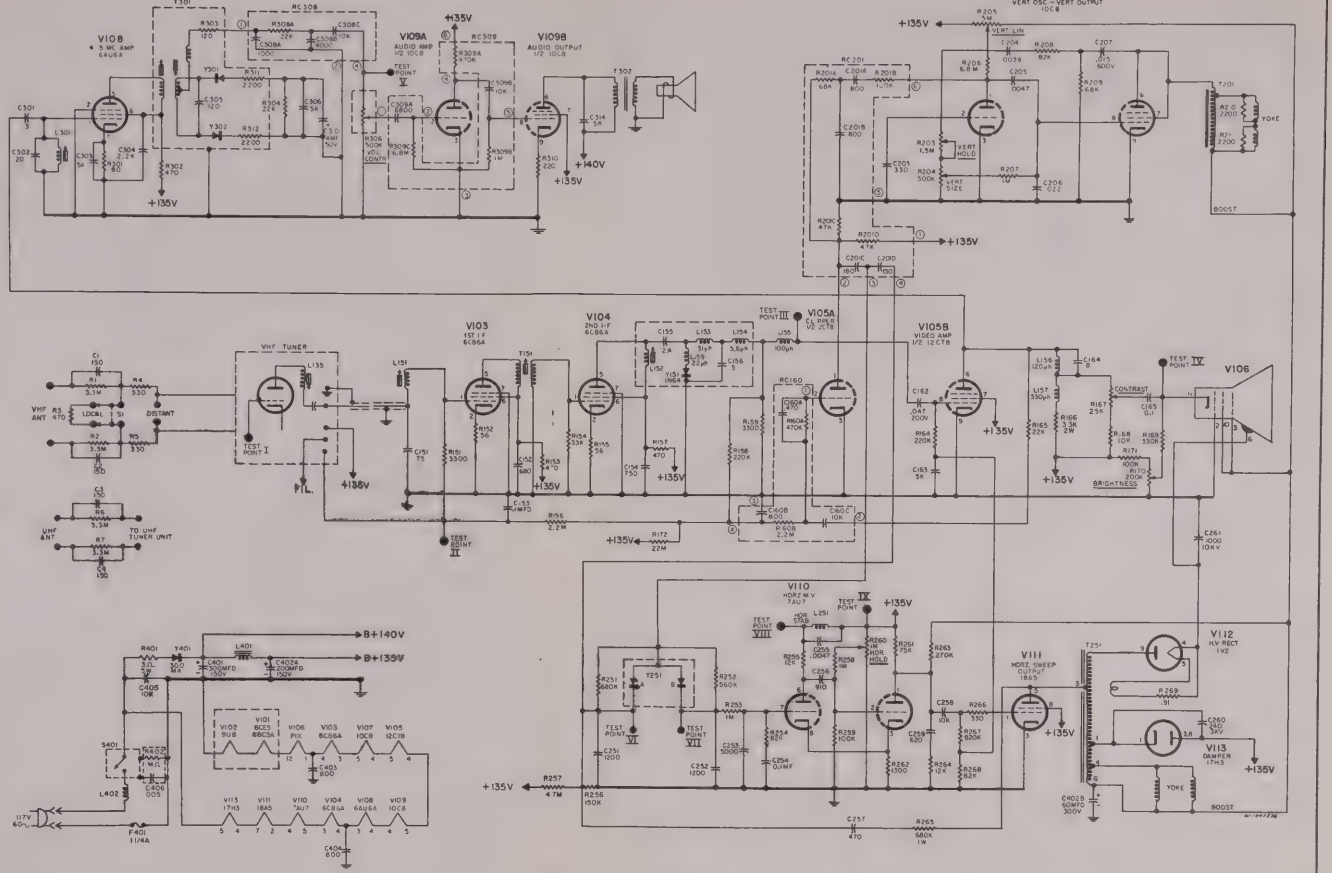
GENERAL ELECTRIC MODELS

9T001 ("T" line)

9T002 ("T" line)



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ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y20, U)

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ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y20, U)

ZENITH MODEL Y1814Y (Ch. 16Y20)

TRADE NAME	Zenith	MODELS	CHASSIS
		Y1814Y, Y1816C, Y1816E, Y1816R	16Y20
		Y1814YU, Y1816CU, Y1816EU, Y1816RU	16Y20U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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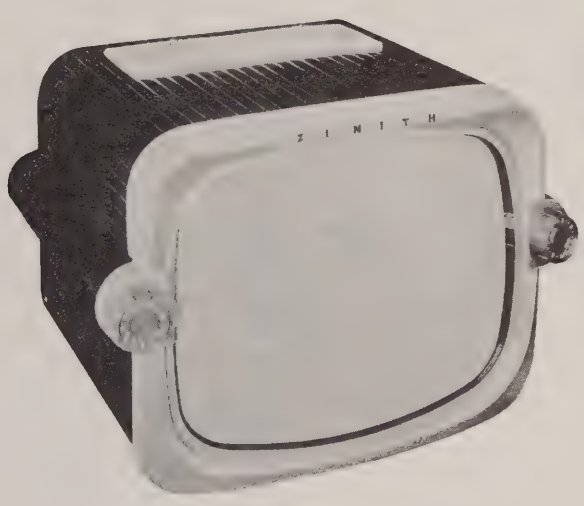

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs (3 knobs from front and 4 knobs from top).

2. Remove 8 metal screws. Remove rear cover.

3. Disconnect speaker leads.

4. Remove 2 metal screws from AGC control bracket and 2 metal screws from AC interlock bracket.

5. Slide entire assembly (chassis, picture tube and mask-safety glass) from front of cabinet.

6. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
Y1814Y	16Y20

ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y20, U)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 push-on type control knobs from front of cabinet. Remove 6 metal screws (3 from each plate) from plates holding safety glass. Remove plates and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal frequency slug (B1), it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control to the center of its range and adjust B1 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control (R8) located on tube side of chassis for maximum volume and MINIMUM buzz.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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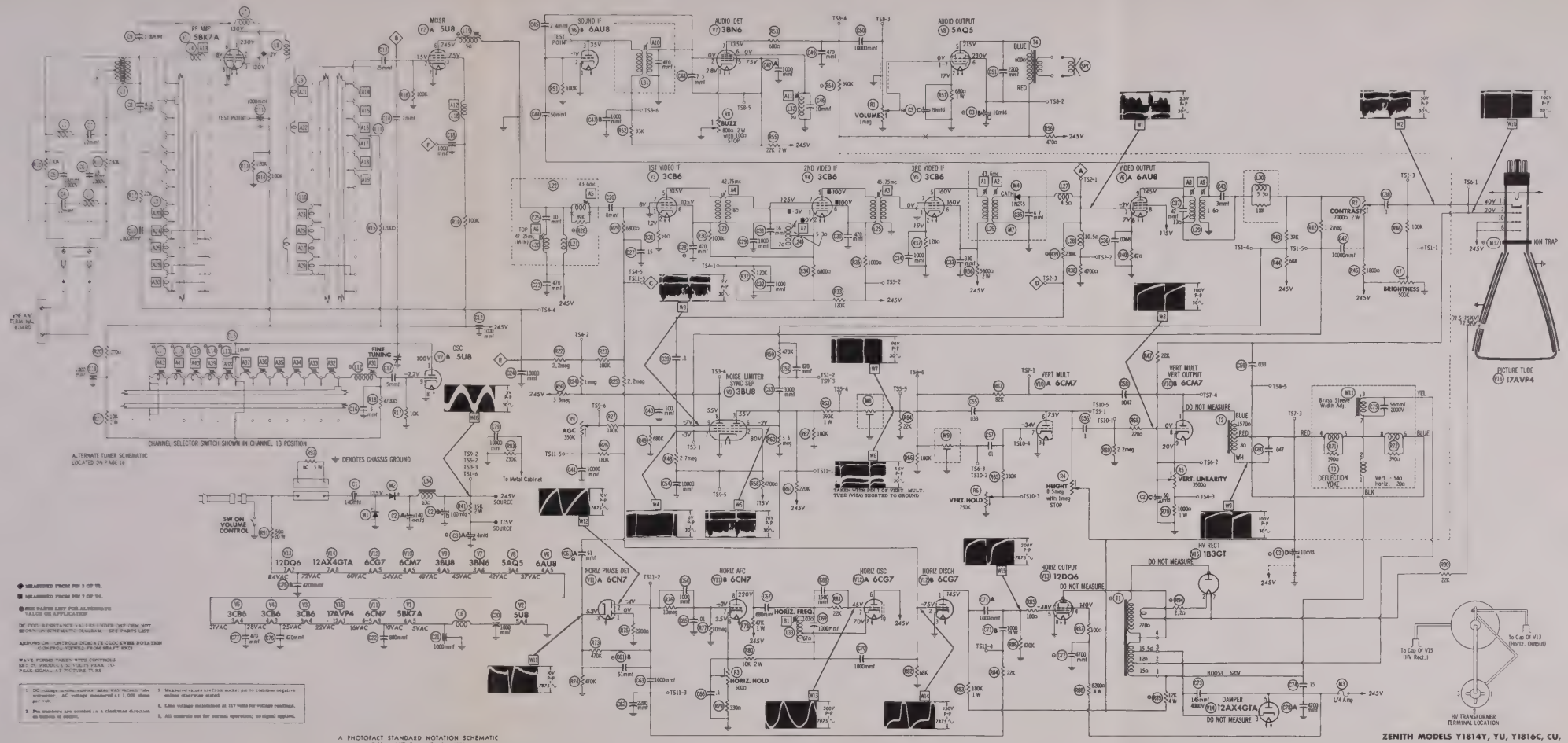
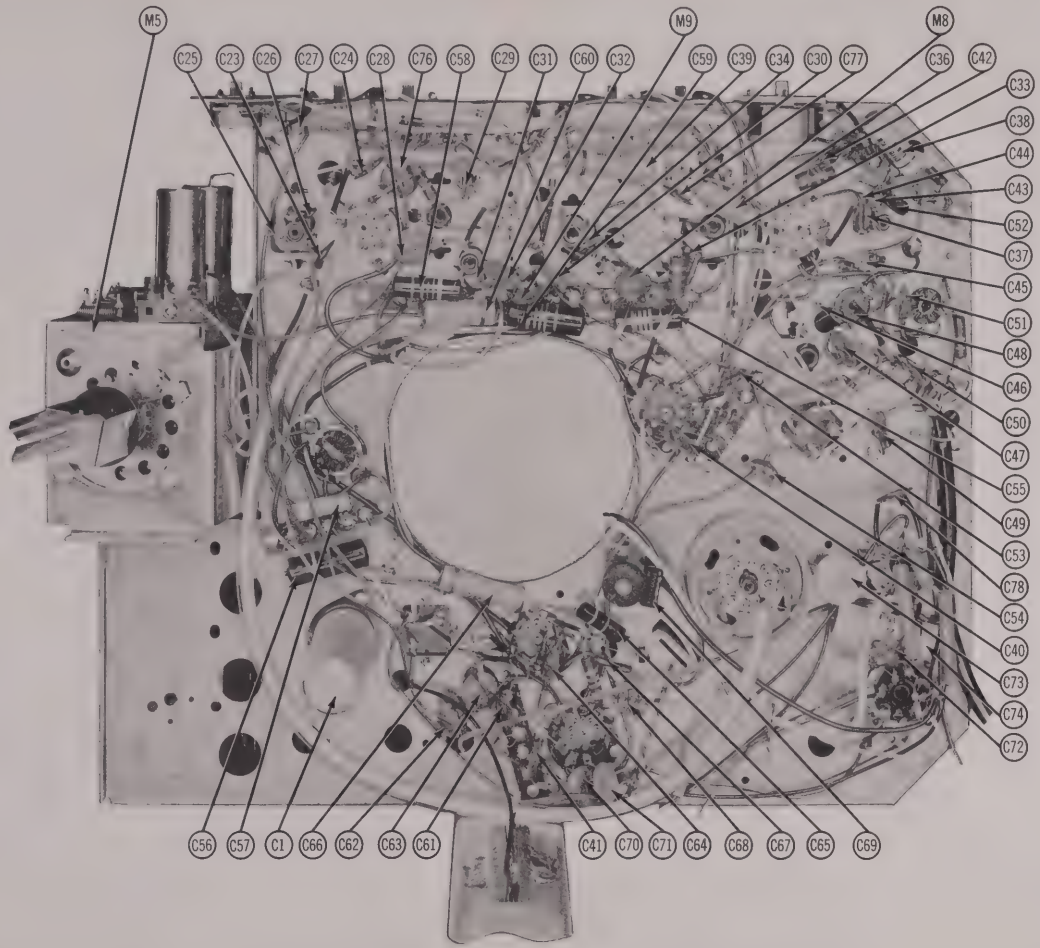
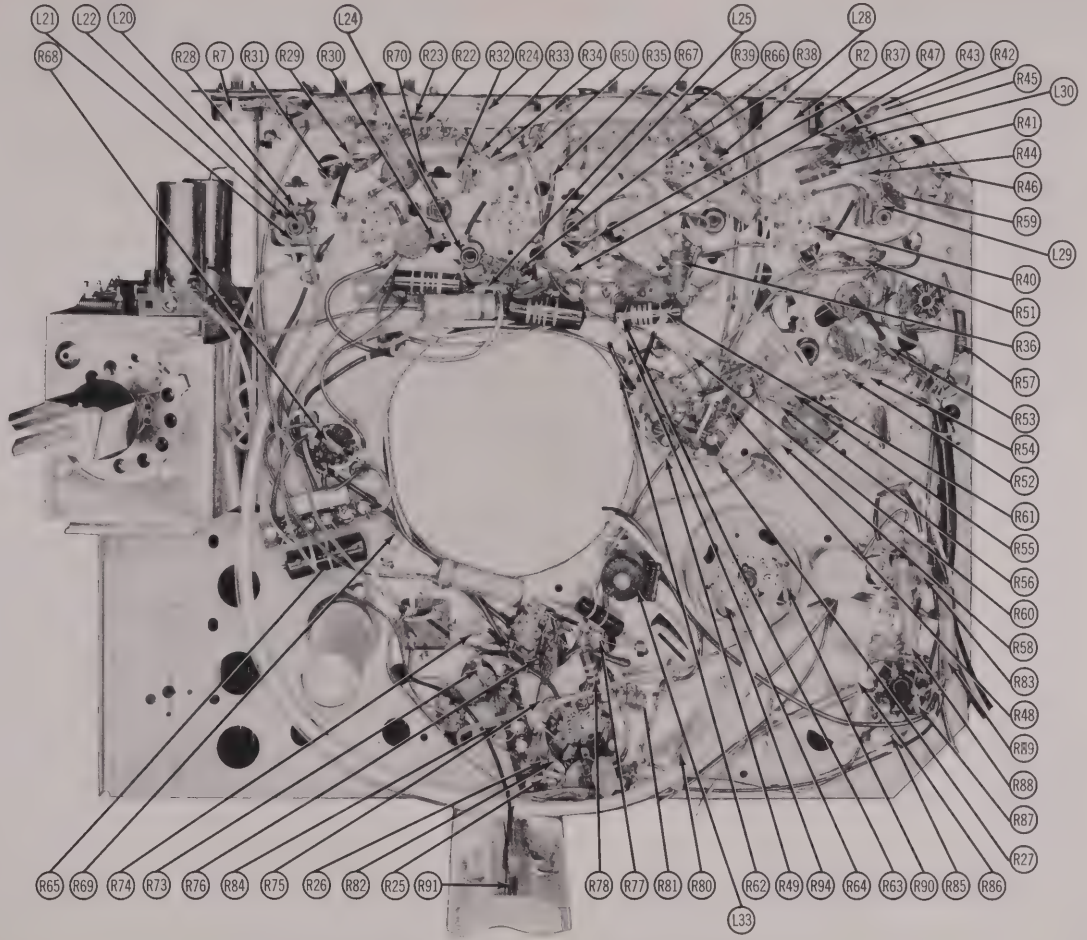
DATE 10-56 SET 333 FOLDER 17


ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y2O, U)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 16
DENOTES CHASSIS GROUND
ION TRAP
PICTURE TUBE
17AVP4
HV TRANSFORMER TERMINAL LOCATION
ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y2O, U)

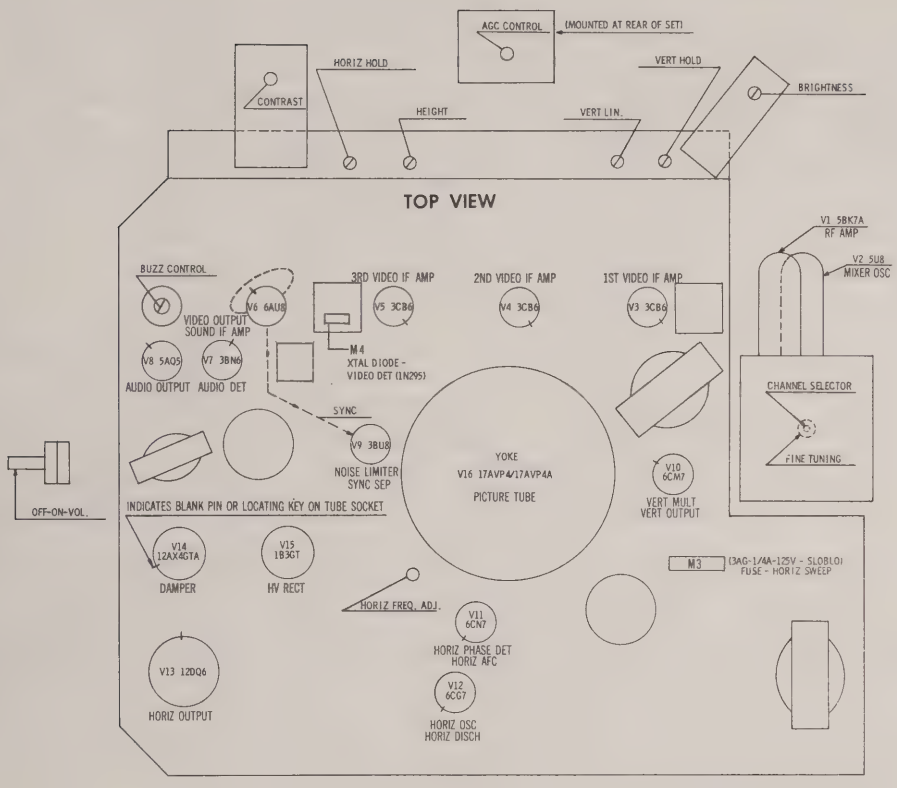


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

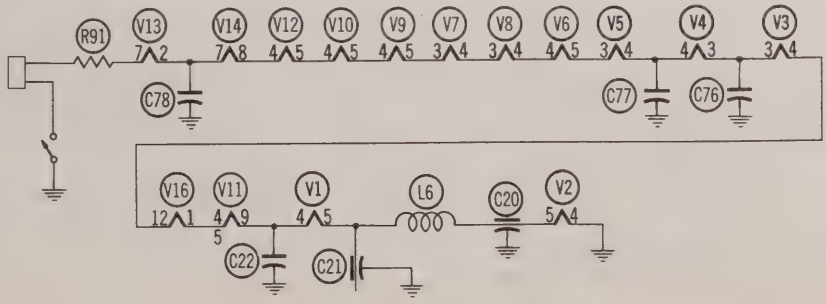
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V9, V10**
No horiz. sync - **V9, V11, V12**
No vert. or horiz. sync - **V9**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16, Fuse (M3)**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, M1, M2**
Vert. off freq. - **V9, V10**
Horiz. off freq. - **V9, V11, V12**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See circuit below).



SET 333 FOLDER 17

ZENITH MODELS Y1814Y, YU, Y1816C, CU, E, EU, R, RU (Ch. 16Y20, U)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal multivibrator tube (V12) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the osc.-mixer tube (V2) from its socket and connect a wire to pin 9. Replace V2 in its socket and connect a clip lead from loose end of wire to chassis. Connect the negative lead of a 5 volt bias supply to point Ⓒ. Connect the positive lead to chassis. Connect a clip lead from point Ⓓ to chassis. In Step 6, attenuate sweep generator output to maintain not more than 3 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to point Ⓑ. Low side to chassis.	Not used.	43.6MC (unmod)	Any	USE VTVM DC probe to point Ⓐ thru 10K. Common to chassis.	A1, A2	Attenuate generator output to maintain not more than -2 volts at VTVM.
2.	"	"	"	45.75MC	"	"	A3	"
3.	"	"	"	42.75MC	"	"	A4	"
4.	"	"	"	43.6MC	"	"	A5	"
5.	"	"	"	47.25MC	"	"	A6	Increase generator output for usable reading on VTVM. Adjust for MINIMUM deflection. Repeat steps 1 thru 5.
6.	"	"	43MC (10MC Swp)	41.25MC 42.75MC 45.0MC 45.75MC 47.25MC	"	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 thru A5 to obtain desired response. Adjust A3 for maximum amplitude of response curve and position of 45.75MC marker. Adjust A4 for position of 42.75MC marker. A1 and A2 affect bandwidth. A5 affects top portion of curve. Increase sweep generator output and check position of 47.25MC trap. If necessary, SLIGHTLY retouch A6 for correct position of 47.25MC marker. The 41.25MC marker should be in proper position on curve after correct bandpass and other marker positions are obtained. Remove wire from pin 9 of V2. Disconnect the bias supply and clip lead from point Ⓓ.
7.	"	"	"	40.5MC	"	"	A7	Remove bias supply and connect clip lead from point Ⓒ to chassis to short AGC line. Adjust for maximum displacment of 40.5MC marker as in Fig. 1 but not to exceed the displacement of 41.25MC marker. Remove the clip lead from point Ⓒ.

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna.
Tune in a modulated TV signal and adjust the attenuator until signal falls below the limiting level of the 3BN6 (limiter-detector) as evidenced by a hiss similar to super-regeneration.
Adjust the sound take-off transformer (A8 and A9), Sound IF transformer (A10), the quadrature coil (A11) for maximum sound of best quality.
Adjust the buzz control (R8) for minimum intercarrier buzz. If during alignment of the sound IF the signal rises above the limiting level of the 3BN6 (hiss disappears) increase the attenuation until hiss returns.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2 volt bias supply to point Ⓔ on tuner. Connect the positive lead to chassis.
Preset A38 at its center adjustment position. In step 14, adjustment A22 is not necessary if proper bandpass is obtainable by adjusting A21.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Fig. 3	Across antenna terminals thru matching network (Fig. 3).	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point Ⓕ. Low side to chassis.	A12, A13	Check for response curve similar to Fig. 4. If necessary, adjust A12 by expanding or compressing coil turns for proper bandwidth. Adjust A13 by expanding or compressing coil turns for maximum amplitude of response curve.
9.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A14	Check for response curve similar to Fig. 4. If necessary, adjust by bending loop in or out from switch rotor for proper response.
10.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A15	"
11.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A16	"
12.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A17	"
13.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A18	"
14.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A19	"
15.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A20, A21, A22	Adjust A21 and A22 for correct bandpass. Adjust A20 for maximum amplitude similar to Fig. 4. A20, A21 and A22 are adjusted by expanding or compressing coil turns.
16.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A23, A24	Adjust by expanding or compressing coil turns for response curve similar to Fig. 4.
17.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A25, A26	"
18.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A27, A28	"
19.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A29, A30	"

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment". Set the fine tuning control to the position where the brass flat shaft is in a horizontal position. Leave it at this mid-range position during entire alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Fig. 3	Across antenna terminals thru matching network. (Fig. 3)	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A31	Adjust to place video marker at 50% on response curve as shown in Fig. 5. Sound marker should be at 5%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A32	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A33	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A34	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A35	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A36	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A37	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A38	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A39	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A40	
			63MC (10MC Swp)	65. 75MC 65. 75MC	3		A41	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A42	

UHF TUNER ALIGNMENT

Alignment of the UHF tuner should not be attempted unless proper test equipment is available.
Switch the receiver to UHF position. Connect the negative lead of a 2 volt bias supply to point Ⓒ. Connect positive lead to chassis.
Adjust the sweep generator output to provide 3 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
21.	Fig. 6	Across antenna terminals thru matching network.	713MC (10MC Swp)	711. 25MC	54	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A43, A44, A45	Tuner rocker arm should be in the horizontal position. If necessary, loosen set screw and adjust tuner so that rocker arm is horizontal when the channel indicator is set to channel 54. Do not adjust A43 unless oscillator calibration is off more than 3 channels. If necessary, adjust A43 to place video marker at 50% on response curve as in Fig. 5. The image (weaker response) will appear also. The response toward the counter clockwise position of A43 is the proper response. Adjust A44 and A45 for maximum amplitude of response similar to Fig. 5.
22.	"	"	473MC (10MC Swp)	471. 25MC	14	"		Check for response curve similar to Fig. 5. If oscillator is off more than 3 channels, adjust the oscillator travel (osc., mixer and antenna travel adjustments are the three round thumb screws on top of tuner) adjustment to scale. Care must be used in making this adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
23.	"	"	887MC (10MC Swp)	885. 25MC	83	"	A46, A47, A48	Adjust A46 to place marker at 50% as in Fig. 5. Adjust A47 and A48 for maximum amplitude and symmetry of response similar to Fig. 5.

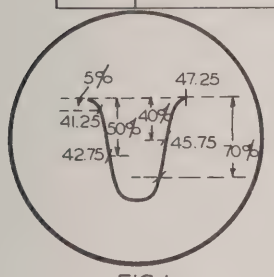


FIG. 1

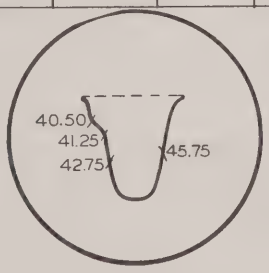
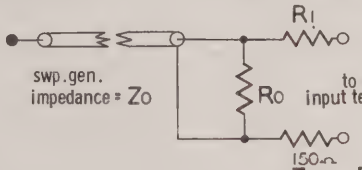


FIG. 2



Zo	Ro	R1
50Ω	50Ω	120Ω
75Ω	82Ω	110Ω
92Ω	110Ω	100Ω

FIG. 3

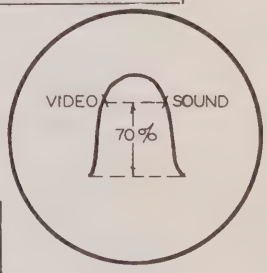


FIG. 4

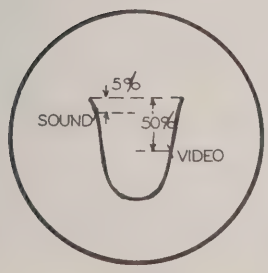


FIG. 5

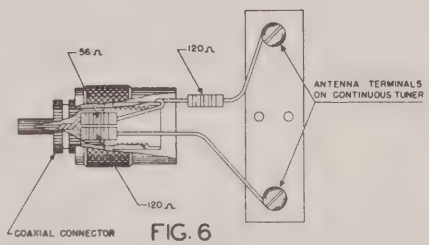
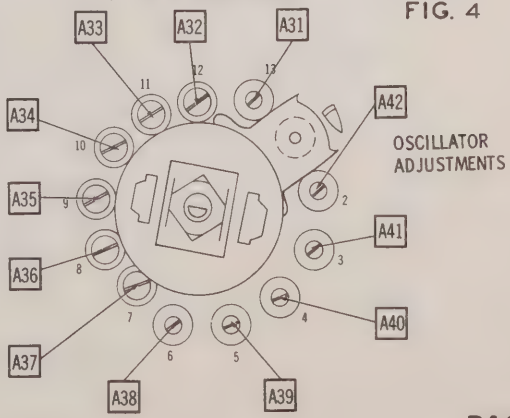


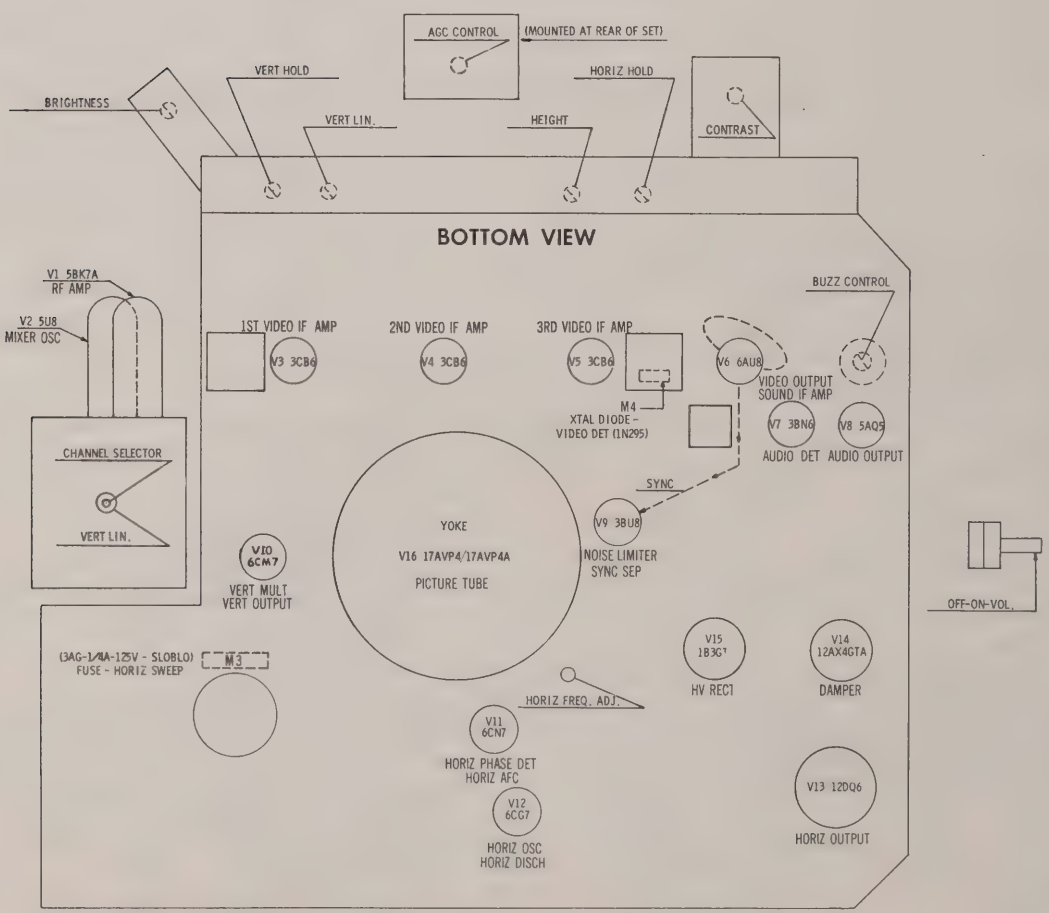
FIG. 6



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5BK7A	†1200Ω	60K	INF	2Ω	1Ω	INF	3.5Meg	0Ω	0Ω
V2	5U8	†10K	100K	†100K	0Ω	1Ω	†70Ω	0Ω	0Ω	10K
V3	3CB6	1.5Meg	56Ω	5Ω	4Ω	▲1000Ω	▲1000Ω	0Ω		
V4	3CB6	▲6800Ω	▲5.3Ω	5Ω	6Ω	†1000Ω	†1000Ω	60K		
V5	3CB6	.1Ω	120Ω	7Ω	6Ω	†5600Ω	†5600Ω	0Ω		
V6	6AU8	0Ω	100K	†55K	8Ω	7Ω	47Ω	4700Ω	†15K	†8000Ω
V7	3BN6	●400Ω	.3Ω	10Ω	9Ω	†22K	5Ω	†400K		
V8	5AQ5	●500K	680Ω	9Ω	8Ω	†1000Ω	†550Ω	●500K		
V9	3BU8	0Ω	†20K	†70K	11Ω	10Ω	3.3Meg	†2.7Meg	†1.5Meg	●230K
V10	6CM7	▰13K	TP	0Ω	12Ω	11Ω	▰●4Meg	●650K	2.2Meg	●1300Ω
V11	6CN7	2200Ω	850K	470K	3Ω	3Ω	●450Ω	5Meg	†47K	2Ω
V12	6CG7	▰180K	70K	0Ω	13Ω	12Ω	†63Ω	32K	10K	NC
V13	12DQ6	TP	16Ω	TP	†8300Ω	470K	TP	18Ω	0Ω	TOP CAP ▰15.5Ω
V14	12AX4GTA	TP	NC	150K	NC	†63Ω	TP	16Ω	13Ω	
V15	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			TOP CAP ▰285Ω
V16	17AVP4	3Ω	23K	Pin 6 †63Ω	Pin 10 †63Ω	Pin 11 ●†150K	Pin 12 4Ω			

† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 7 OF V4.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▰ MEASURED FROM PIN 3 OF V14.
TP TIE POINT
NC NO CONNECTION



TUBE PLACEMENT CHART

CHASSIS TOP VIEW

ZENITH MODELS Y1814Y, YU, Y1816C, CU,
E, EU, R, RU (Ch. 16Y20, U)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	5BK7A	
V2	Mixer-Osc.	5U8	
V3	1st Video IF Amp.	3CB6	
V4	2nd Video IF Amp.	3CB6	
V5	3rd Video IF Amp.	3CB6	
V6	Video Output-Sound IF Amp.	6AU8	
V7	Audio Det.	3BN6	
V8	Audio Output	5AQ5	
V9	Noise Limiter-Sync Sep.	3BU8	
V10	Vert. Mult. - Vert. Output	6CM7	
V11	Horiz. AFC-Horiz. Phase Det.	6CN7	
V12	Horiz. Osc. - Horiz. Discharge	6CG7	
V13	Horiz. Output	12DQ6	
V14	Damper	12AX4GTA	
V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ZENITH PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	17AVP4 17AVP4A ①	17AVP4A ①	17AVP4A ①	17AVP4 17AVP4A②	① Aluminized ② Silver Screen"85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	140	150	22-2745	AFHS1-70	XA004	FP117	TMS-24	T050	TVL-1428
C2A	▲150	300	22-2741	AFH3-99-83		FP326.7		Q-221.5	R2300*
B	■100	300						MT-4580	
C	▲60	50							
C3A	▲4	300	22-2874-Note 1	AFH4-112-60		FP474.5		Q-205	R2301*
B	■10	300	Note 1					MT-4710	
C	20	25	Note 1						
D	●10	475	Note 1						

Note 1: In some versions C3D is a separate non-polarized unit (part #22-2870) (C3A, B, C part #22-2739)
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	12		22-2679		TCZ-12	Z019	NP0K-120			
C5	18	1000	22-2680	HVD-15-15	DD30-150	VQ15	1R5KV-150	DC30415	10GA-Q18	
C6	18	1000	22-2680	HVD-15-15	DD30-150	VQ15	1R5KV-150	DC30415	10GA-Q18	
C7	12		22-2679		TCZ-12	Z019	NP0K-120			
C8	8.2		22-2681	NP0-DI8.2		Z016	NP0A-8R2			
C9	1.8		22-2428	NP0-SI1.5	TCZ-1R5	TZ04	NP0A-1R5	ZT-5515	5TCCB-V18	
C10	1000		22-2732							
C11	1000		22-2677							
C12	1000		22-2732							
C13	25		22-2671	N750-DI25	TCN-25	N026	N750K-250		5TCU-Q25	
C14	1		22-2720	NP0-SI1	TCZ-1	TZ03	NP0A-010		5TCCB-V1	
C15	1		22-2714							
C16	5		22-2716				N330A-4R7			
C17	5		22-2716				N330A-4R7			
C18	1000		22-2732							
C19	1000		22-2732							
C20	1000		22-2732							
C21	1000		22-2732							
C22	800		22-2331	BPD-0008	DD-801	G067	811-821		5GA-T8	
C23	470		22-6	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C24	10000		22-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C25	10		22-2731							
C26	8		22-2481	NP0-DI8.2		Z015	NP0A-8R2			
C27	.15	200	22-2852	CUB2P15		CUB2P15		PT4015	2TM-P15	
C28	470		22-6	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	Note 2
C29	1000		22-7	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C30	470		22-16	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C31	16		22-2296	NP0-SI15	TCZ-15	Z021	NP0K-150		5TCC-Q15	
C32	1000		22-17	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C33	330		22-2866	BPD-00033	DD-331	TP43	811-331	UC-5333	5GA-T33	
C34	1000		22-17	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C35	4.7		22-2867							
C36	.0068	200	22-2819	BPD-0068	D6-682	CUB6D68	GP3-333-682	PT6268	6TM-D68	
C37	47		22-2467							
C38	.1	200	22-1777	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C39	.1	200	22-2780	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C40	100		22-9	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C41	10000		22-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C42	10000		22-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C43	3		22-2343	NP0-SI3	TCZ-3R3	Z007	NP0A-030	ZT-553	5TCCB-V33	
C44	50		22-2460	NP0-SI50	TCZ-50	Z034	NP0-338-500	ZT-545	5TCC-Q5	
C45	2.4		22-2596	NP0-SI2.2	TCZ-2R2	TZ05	NP0A-2R2	ZT-553	5TCCB-V22	
C46	10		22-2731	NP0-DI10	DD-100	Z018	831-100	ZT-541	5TCC-Q1	
C47A	1000		22-21	BPD-2X001	DD2-102	DK069	812-001	DCD521	5HK-2D1	
B	1000									
C48	7.5		22-2742							
C49	470		22-6	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C50	10000		22-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C51	2200		22-8	BPD-0022	D6-222	K073	811-0022	UC-5222	5HK-D22	
C52	470		22-6	BPD-00047	DD-471	K060	811-471	UC-5347	5GA-T47	
C53	3300		22-11	BPD-0033	D6-332	K077	811-0033	UC-5233	5HK-D33	
C54	10000		22-3	BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C55	.033	400	22-2635							
C56	.1	400	22-2061	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C57	.01	200	22-2565	1464-01		1DR351		MCB475	MS-11	
C58	.0047	600	22-1849							
C59	.033	600	22-2235							
C60	.047	200	22-2792	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C61A	51		22-25	1469-000051	TCZ-51	Z035	NP0-338-510	MCB225	MS-451	Note 3
B	51			1469-000051	TCZ-51	Z035	NP0-338-510	MCB225	MS-451	Note 4
C62	2200		22-16	1464-0022		1R5D22		UC-5222	5HK-D22	
C63	1000		22-17	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C64	1000		22-17	BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C65	.01	400	22-1809	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C66	.1	200	22-2780	P288N-1	DF-104	CUB2P1		PT401	4TM-P1	
C67	680		22-2668	1464-00068	D6-681	1R5T68	811-681		MS-368	
C68	1500		22-12	1464-0015		1R5D15	811-152	MCB456	MS-215	
C69	1000		22-2163	1464-001		1R5D1	811-102	MCB255	MS-21	
C70	1000		22-17	BPD-001	DD-102	K069	811-102	DC521	5HK-S1	
C71A	1000		22-21	BPD-2X001	DD2-102	DK069	812-001	DCD521	5HK-2D1	
B	1000									
C72	4700		22-14	BPD-00047	DD-472	K079	811-0047	UC-5247	5HK-D47	Note 5
C73	145	4000	22-2869							

PARTS LIST A

CAP

ITEM No.	RATING		ZENITH PART No.	AEROVOX PART No.	CENTR PART
	CAP.	VOLT			
C74	.15	400	22-2261	P488N-15	
C75	56	2000			
C76	470		22-6	BPD-00047	DD-4
C77	470		22-6	BPD-00047	DD-4
C78A	4700		22-24	BPD-2X0047	DD-4
B	4700				DD-4
C79	10000		22-2655	BPD-01	DD-1

Note 2: Some versions may use 330MMF in this application.
Note 3: Some versions may use 47MMF unit (part #22-1662)
Note 4: Some versions may use 56MMF unit (part #22-1831)
Note 5: Some versions may use .047MFD unit (part #22-1775

CO

ITEM No.	RATING		REPLACEM		
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAR PAR
R1A	1Meg	½	63-3618	B-69-S	A47-1
B	Shaft		Not Req.	Not Req.	FS-3
C	Switch		Not Req.	Not Req.	SWE-1
R2	7000Ω	2	63-3609		
R3	500Ω	½	63-3624		
R4A	8.5Meg With 1Meg Stop	½	63-3263	♦AB-89	♦A47-7
B	Shaft		Not Req.	AK-19	RN-3
R5A	3500Ω	½	63-3266	AB-9	A47-4
B	Shaft		Not Req.	AK-19	RN-3
R6A	750K	½	63-3262		
B	Shaft				
R7A	500K	½	63-3264		
B	Shaft				
R8	800Ω	2	63-3284		39-80
R9A	350K	½	63-3625	AB-59	A47-5
B	Shaft		Not Req.	AK-1	FKS-1

♦ Connect a 1Meg resistor in series with the right hand termi terminal of the original control. (Control viewed from shaft

RES

All wattages 1/2 watt, or

ITEM No.	RATING		REPLACEMENT DATA		NOTE
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R10	230K		63-3607	BTS-220K	
R11	230K		63-3607	BTS-220K	
R12	22K		63-1841	BTS-22K	
R13	120K		63-1873	BTS-120K	
R14	100K		63-1869	BTS-100K	
R15	1200Ω			BTS-1200	
R16	100K		63-1869	BTS-100K	
R17	10K		63-1827		
R18	4700Ω		63-1813	BTS-4700	
R19	100K		63-1869	BTS-100K	
R20	270Ω			BTS-270	
R21	10K	2	63-3176	BTB-10K	
R22	2.2Meg		63-1926	BTS-2.2Meg	
R23	100K		63-1869	BTS-100K	
R24	1Meg		63-1911	BTS-1Meg	
R25	2.2Meg		63-1926	BTS-2.2Meg	
R26	180K		63-1880	BTS-180K	
R27	180K		63-1880	BTS-180K	
R28	39K		63-1852	BTS-39K	Note 1
R29	6800Ω		63-1821	BTS-6800	
R30	1000Ω		63-1786	BTS-1000	
R31	56Ω		63-1733	BTS-56	
R32	120K		63-1873	BTS-120K	
R33	120K		63-1873	BTS-120K	
R34	6800Ω		63-1821	BTS-6800	
R35	1000Ω		63-1786	BTS-1000	
R36	5600Ω	2	63-3223	BTB-5600	
R37	120Ω		63-1747	BTS-120	
R38	4700Ω		63-1813	BTS-4700	
R39	230K		63-3607	BTS-220K	Note 2
R40	47Ω		63-1729	BTS-47	
R41	15K	2	63-942	BTB-15K	
R42	1.2Meg		63-1915	BTS-1.2Meg	
R43	39K		63-1852	BTS-39K	
R44	68K		63-1862	BTS-68K	
R45	1800Ω		63-1796	BTS-1800	
R46	100K		63-1869	BTS-100K	
R47	22K		63-1841	BTS-22K	
R48	2.7Meg		63-1926	BTS-2.7Meg	
R49	680K		63-1904	BTS-680K	
R50	3.3Meg		63-1932	BTS-3.3Meg	
R51	100K		63-1869	BTS-100K	
R52	33K		63-1849	BTS-33K	

Note 1: Not used in some versions.
Note 2: Some versions use a 47K resistor in this
Note 3: Some versions use a 1.5Meg resistor in
Note 4: Some versions use a 10K 4W resistor in
Note 5: Resistance of HV rect. fil leads (length
resistor, use standard HV fil. wire in pl

TRANSFORMERS

ITEM No.	USE	ZENITH PART No.	Halldorson PART No.	M PAR
T1	Horiz. Output Trans.	S-23995 S-23998 ①		
T2	Vert. Output Trans.	95-1475	Z1900②③	A-30
T3	Yoke(90°) Horiz(13MH) Vert. (49MH)	95-1435 ⑤	DF606④	MDF

① Alternate Zenith part no.
② Use 15 to 1 turns ratio.
③ Connect as auto trans.
④ Drill new mounting hole(s).
⑤ Includes capacitor C75. Resistors R71 and R72.
⑥ Use original yoke damping network if necessary.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	5BK7A	
V2	Mixer-Osc.	5U8	
V3	1st Video IF Amp.	3CB6	
V4	2nd Video IF Amp.	3CB6	
V5	3rd Video IF Amp.	3CB6	
V6	Video Output	6CG7	
	Sound IF Amp.	6AU8	
V7	Audio Det	3BN6	
V8	Audio Output	6AQ5	
V9	Noise Limiter-Sync Sep.	3BU8	

ITEM No	USE	TYPE	NOTES
V10	Vert. Mult. - Vert. Output	6CM7	
V11	Horiz. AFC - Horiz. Phase Det.	6CN7	
V12	Horiz. Osc. - Horiz. Discharge	6CG7	
V13	Horiz. Output	12DQ6	
V14	Damper	12AX4GTA	
V15	RF Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	ZENITH	CBS	GENERAL ELECTRIC	SYLVANIA	
	PART No	PART No	PART No	PART No	
V16	17AVP4			17AVP4	1) Aluminized
	17AVP4A D	17AVP4A D	17AVP4A D	17AVP4A 2) D	2) Silver Screen"SS"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	ZENITH PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	140	150	AF181-10	XA004	FP117	TM5-24	T050	TVL-1428	
C3A	▲180	300	33-2741		FP338.7		TVL-351.5	B3300*	
B	▲100	300					MT-4680		
C	▲40	50							
C3A	▲4	300	33-2974-Note 1	AF84-113-80	FP474.5		Q-305	B3301*	
B	▲10	300	Note 1				MT-4710		
C	30	25	Note 1						
D	▲10	475	Note 1						

Note 1: In some versions C3D is a separate non-polarized unit (part #23-2870 (C3A, B, C part #23-2739)
* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA								NOTES
	CAP	VOLT	ZENITH PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No		
C4	12		33-2679		TCZ-12	Z012		NP0X-120			
C5	18	1000	33-2680		HVD-15-15	DD30-150	VQ15	1R5KV-150	DC30415	10GA-Q18	
C6	18	1000	33-2680		HVD-15-15	DD30-150	VQ15	1R5KV-150	DC30415	10GA-Q18	
C7	12		33-2679		TCZ-12	Z012		NP0X-120			
C8	8.2		33-2682			Z018		NP0A-SR2			
C9	1.8		33-2438		TCZ-1R5	T204		NP0A-1R5	ZT-5S15	5TCCB-V18	
C10	1000		33-2732								
C11	1000		33-2672								
C12	1000		33-2732								
C13	33		33-2671		TCN-25	N026		N750X-350		5TCU-Q25	
C14	1		33-2730		TCZ-1	T203		N90A-010		5TCCB-V1	
C15	1		33-2714								
C16	5		33-2716					N330A-4R7			
C17	3		33-2718					N330A-4R7			
C18	1000		33-2733								
C19	1000		33-2733								
C20	1000		33-2733								
C21	1000		33-2732								
C22	800		33-2231		BPD-0008	DD-801	G06T	811-881		5CA-T8	
C23	800		33-6		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C24	1000		33-2		BPD-01	DD-103	KD83	811-01	DC511	5HK-B1	
C25	10		33-2731				Z019	NP0A-SR2			
C26	8		33-2681		NP0-D18.2		CUBD2P15		PT401S	5TM-P15	
C27	15	300	33-2852		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	Note 2
C28	470		33-6		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C29	1000		33-7		BPD-001	DD-102	KD89	801-001	DC521	5HK-D1	
C30	470		33-18		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C31	18		33-2396		NP0-S15	TCZ-15	Z021	NP0X-180		5TCC-Q85	
C32	1000		33-17		BPD-001	DD-102	KD89	801-001	DC521	5HK-D1	
C33	150		33-2866		BPD-00023	DD-331	TP43	811-331	UC-5333	5GA-T33	
C34	1000		33-17		BPD-001	DD-102	KD89	801-001	DC521	5HK-D1	
C35	25		33-2867								
C36	0068	300	33-2859		BPD-0068	D6-682	CUBD6S8	GP3-333-682	PT6268	5TM-D68	
C37	47		33-2477								
C38	1	300	33-1777		P288N-1	DF-104	CUBD2P1		PT401	5TM-P1	
C39	1	300	33-2780		P288N-1	DF-104	CUBD2P1		PT401	5TM-P1	
C40	100		33-9		BPD-001	DD-101	G042	801-101	UC-531	5GA-T1	
C41	10000		33-3		BPD-01	DD-103	KD82	811-01	DC511	5HK-B1	
C42	10000		33-3		BPD-01	DD-103	KD82	811-01	DC511	5HK-B1	
C43	3		33-2343		NP0-S13	TCZ-3R3	Z007	NP0A-020	ZT-S5S	5TCCB-V33	
C44	5		33-2480		NP0-S150	TCZ-5R1	Z034	NP0A-3S2-500	ZT-S4S	5TCC-Q5	
C45	2.4		33-2596		NP0-S12.2	TCZ-2R2	TZ05	NP0A-2R2	ZT-S6S	5TCCB-V2R2	
C46	10		33-2731		NPO-Q20	DD-100	Z018	811-100	ZT-S4S	5TCC-Q2	
C47A	1000		33-21		BPD-2X001	DD3-102	DK049	813-001	DCD521	5HK-2D1	
B	1000										
C48	7.5		33-2743								
C49	470		33-6		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C50	1000		33-3		BPD-01	DD-103	KD83	811-01	DC511	5HK-B1	
C51	2500		33-8		BPD-0022	D6-222	KD73	811-0022	UC-5322	5HK-D22	
C52	470		33-6		BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C53	4700		33-11		BPD-0023	D6-232	KD77	811-0033	UC-5333	5HK-D33	
C54	10000		33-3		BPD-01	DD-103	KD83	811-01	DC511	5HK-B1	
C55	10000		33-3								
C56	.1	600	33-2035		P488N-1	DF-104	CUBA1P1		PT401	4TM-P1	
C57	.01	500	33-2566				IDR3B1		MC5470	M6-11	
C58	.0047	600	33-1849								
C59	.033	600	33-2335								
C60	.047	300	33-2782		BPD-05	DF-503	CUBD5A7		PT4147	5TM-S47	
C61A	51		33-25		1469-00005	TCZ-51	Z035	NP0-338-510	MCB525	M6-451	Note 3
B	51				1469-00051	TCZ-51	Z035	NP0-338-510	MCB525	M6-451	Note 4
C62	3300		33-18		1464-0022				LRSD522	5HK-D22	
C63	1000		33-17		BPD-001	DD-102	KD89		801-001	DC521	5HK-D1
C64	1000		33-17		BPD-001	DD-102	KD89		801-001	DC521	5HK-D1
C65	.01	600	33-1809		BPD-01	D6-103	CUBA5K		GP3-333-103	PT451	4TM-P1
C66	.1	300	33-2780		P288N-1	DF-104	CUBD2P1			PT401	4TM-P1
C67	680		33-2568		1464-00068	D6-681	1R5T68		811-681		M5-368
C68	1500		33-18		1464-0015		1R5D15		811-152	MCB456	M5-215
C69	1000		33-2163		1464-001		1R5D1		811-102	MCB355	M5-21
C70	1000		33-17		BPD-001	DD-102	KD89		811-102	DC521	5HK-B1
C71A	1000		33-21		BPD-2X001	DD3-102	DK049		812-001	DCD521	5HK-2D1
B	1000										
C72	4700		33-14		BPD-00047	DD-472	K079		811-0047	UC-5247	5HK-D47
C73	145	4000	33-2869								Note 5

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C74	15	400	33-2281	P488N-15		CUB4P15		PT401S	4TM-P15	
C75	56	2000								
C76	4700		33-6	BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C77	470		33-6	BPD-00047	DD-471	KD80	811-471	UC-5347	5GA-T47	
C78A	4700		33-24	BPD-2X0047	DD-472	DD479	811-0047	UC-5347	5HK-4D47	
B	4700				DD-473		811-0047	UC-5347		
C79	10000		33-2655	BPD-01	DD-103	KD82	811-01	DC511	5HK-B1	

Note 2: Some versions may use 330MMF in this application. (part #23-2309)
Note 3: Some versions may use 47MMF unit (part #23-1663) in this application.
Note 4: Some versions may use 56MMF unit (part #23-1831) in this application.
Note 5: Some versions may use .047MFD unit (part #23-1778) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	1	63-3618	B-69-S	A47-1Meg-S	QU-137	U54	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWR-13	UB-38	Not Req.	Attach to R1A
R2	7000Ω	2	63-3609			WPK7500		Contrast (Wire-wound)
R3	500Ω	2	63-3624				PTA83L	Horiz. Hold
R4A	5.5Meg	1	63-3283	64B-89	64A47-7.5Meg-S	64QU-163	4PTA65L	Height
	With 1Meg Stop							
B	Shaft		Not Req.	AK-19	RM-3	TQ	Not Req.	Attach to R4A
R5A	3500Ω	2	63-3286	AB-3	A47-4000-S	QU-114	PTA35L	Vert. Linearity
B	Shaft		Not Req.	AK-19	RM-3	TQ	Not Req.	Attach to R5A
R6A	750K	2	63-3261			QU-136	PTA75L	Vert. Hold
B	Shaft					TQ		Attach to R6A
R7A	500K	1	63-3264			QU7-133	PTA55R	Brightness
B	Shaft					TQ		Attach to R7A
R8	800Ω	2	63-3284		39-800-50			Buzz (Wire-wound) 100Ω stop
R9A	350K	1	63-3235	AB-39	A47-4000-S	QU-132	TA35L	AGC
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R9A

* Connect a 1Meg resistor in series with the right hand termina. of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No	IRC PART No	
R10	250K		63-3607	BTS-220K	
R11	220K		63-3607	BTS-220K	
R12	22K		63-1841	BTS-22K	
R13	330K		63-1873	BTS-330K	
R14	100K		63-1869	BTS-100K	
R15	1800Ω			BTS-1200	
R16	100K		63-1869	BTS-100K	
R17	10K		63-1827		
R18	47000Ω		63-1853	BTS-4700	
R19	100K		63-1869	BTS-100K	
R20	3700Ω			BTS-370	
R21	10K	2	63-3178	BTS-10K	
R22	2.2Meg		63-1819	BTS-2.2Meg	
R23	100K		63-1869	BTS-100K	
R24	1Meg		63-1961	BTS-1Meg	
R25	2.2Meg		63-1958	BTS-2.2Meg	
R26	180K		63-1880	BTS-180K	
R27	180K		63-1880	BTS-180K	
R28	39K		63-1852	BTS-39K	Note 1
R29	6800Ω		63-1851	BTS-6800	
R30	1000Ω		63-1798	BTS-1000	
R31	56Ω		63-1733	BTS-56	
R32	120K		63-1873	BTS-120K	
R33	120K		63-1873	BTS-120K	
R34	6800Ω		63-1851	BTS-6800	
R35	1000Ω		63-1798	BTS-1000	
R36	5600Ω	2	63-3233	BTS-5600	
R37	1300Ω		63-1747	BTS-130	
R38	4700Ω		63-1853	BTS-4700	
R39	220K		63-3607	BTS-220K	Note 3
R40	47Ω		63-1729	BTS-47	
R41	15K	2	63-943	BTS-15K	
R42	1.3Meg		63-1915	BTS-1.3Meg	
R43	39K		63-1852	BTS-39K	
R44	68K		63-1881	BTS-68K	
R45	1800Ω		63-1798	BTS-1800	
R46	100K		63-1869	BTS-100K	
R47	22K		63-1841	BTS-22K	
R48	2.7Meg		63-1821	BTS-2.7Meg	
R49	68Ω		63-1904	BTS-680K	
R50	5.3Meg		63-1933	BTS-3.3Meg	
R51	100K		63-1869	BTS-100K	
R52	33K		63-1849	BTS-33K	

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No	IRC PART No	
R53	680K		63-1777	BTS-680	
R54	390K		63-1894	BTS-390K	Note 3
R55	22K	2	63-1866	BTS-22K	
R56	470Ω		63-1777	BTS-470	
R57	680Ω	1	63-2290	BTA-680	
R58	4700Ω		63-1873	BTS-4700	
R59	470K		63-1898	BTS-470K	
R60	2.2Meg		63-1923	BTS-2.2Meg	
R61	220K		63-1863	BTS-220K	
R62	100K		63-1869	BTS-100K	
R63	390K		63-1894	BTS-390K	
R64	33K		63-1841	BTS-33K	
R65	330K		63-1899	BTS-330K	
R66	100K		63-1869	BTS-100K	
R67	82K		63-1866	BTS-82K	
R68	220Ω		63-1756	BTS-220	
R69	2.2Meg		63-1958	BTS-2.2Meg	
R70	1000Ω	1	63-966	BTA-1000	
R71	390Ω				
R72	1900Ω				
R73	470K		63-1898	BTS-470K	
R74	470K		63-1898	BTS-470K	
R75	4700Ω		63-1799	BTS-2200	
R76	10Meg		63-1953	BTS-10Meg	
R77	10Meg		63-1953	BTS-10Meg	
R78	47K	1	63-1194	BTA-47K	
R79	330Ω		63-1764	BTS-330	
R80	10K	2	63-2145	BTB-10K	
R81	22K		63-1841	BTS-22K	
R83	68K		63-1863	BTS-68K	
R84	180K	1	63-2313	BTA-180K	
R84	82K		63-1841	BTS-82K	
R85	100Ω		63-1744	BTS-100	
R86	470K		63-1898	BTS-470K	
R87	100Ω		63-1744	BTS-100	
R88	8200Ω	4	63-3603	FW4-8200	
R89	18K	4			
R90	22K		63-1843	BTS-22K	
R91	50Ω	30	63-2272	3D-50	
R92	5Ω	5	63-2287		
R93	330K		63-3607	BTS-330K	
R94	2.2Ω			BW1-2.2	Note 5

Note 1: Not used in some versions.
Note 2: Some versions use a 47K resistor in this application. (part #63-1855)
Note 3: Some versions use a 1.5Meg resistor in this application. (part #63-1918)
Note 4: Some versions use a 10K 4W resistor in this application. (part #63-3623)
Note 5: Resistance of HV rect. fil leads (length of #30 advance resistance wire) when replacing with standard resistor, use standard HV fil. wire in place of resistance wire.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordorson PART No	Triad PART No	
T1	Horiz. Output Trans.	S-23995								
T2	Vert. Output Trans.	S-23998 1) 95-1675		Z1900 2)	A-3030 3)		V33Z 3)	A-8141 3)	26654 3)	A-109X 3) 4)
T3	Yoke(90°) Horiz(13MH) Vert.(49MH)	95-1435 5)	DF808 5)	MDF-91 5)	23TD1 5)	Y90F12/47 5)	DY-13A 5)	Y-14 5)	Y-40-1 5)

1) Alternate Zenith part no.
2) Use 15 to 1 turns ratio.
3) Connect as auto trans.
4) Drill new mounting hole(s).
5) Includes capacitor C75. Resistors R71 and R72.
6) Use original yoke damping network if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No	
T4	20.1K	3-4Ω	95-1438					S-11X	

SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.		ZENITH PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω		48-750	4A07	215S3	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	IF Trap	.1Ω		56-567				
L2	IF Trap	.1Ω		56-567				
L3	Ant.-Trans	01*		S-23632				*Tapped Channel 13
L4	Ant. Coil	0Ω		20-600				
L5	Ant. Coils	0Ω		S-23941				
L6	1st Coils	0Ω		20-532				
L7	Neut. Coil	0Ω		20-533				
L8	RF Coil	0Ω		20-530				Channel 13
L9	RF Coil	0Ω		20-579				Channel 8
L10	RF Coils	0Ω		S-23940				Low Bands
L11	RF Coils	0Ω		20-571				High Bands
L12	Osc. Coil	0Ω		20-527				Channel 13 - Note 1
L13	Osc. Coil	0Ω		20-526				Channel 8 - Note 1
L14	Osc. Coil	0Ω		20-626				Channel 5 - Note 1
L15	Osc. Coil	0Ω		20-523				Channel 4- Note 1
L16	Osc. Coil	0Ω		20-523				Channel 2 - Note 1
L17	Osc. Coil	0Ω		20-523				Channel 3 - Note 1
L18	RF Choke	0Ω		20-533				
L19	Conv. Fbds	.1Ω		S-24377				Alternate part #5-34758 used with tuner #5-23302.
L20	IF Trap	.1Ω		S-23939				
L21	RF Choke	0Ω		20-550				
L22	1st Video IF	.1Ω		S-24901				
L23	2nd Video IF	.1Ω	8Ω	S-23993				
L24	Cathode Trap	8Ω		S-24089				Tapped ② .7Ω
L25	3rd Video IF	.1Ω	.1Ω	S-23993				
L26	4th Video IF	.3Ω	.3Ω	S-23490				
L27	Series Peaking Coil	4.5Ω		S-23444		19-6033		6636 35 Microhenries
L28	Shunt Peaking Coil	10.5Ω		S-16015		19-3300	TV-180	6133 325 Microhenries
L28A	4.5MC Trap	15Ω						
B	1st Sound IF	1.8Ω		S-23350				
L30	Series Peaking Coil	5.5Ω		S-20880		19-3125 ③		6152 ③ 137 Microhenries; Wound on 18K resistor
L31	2nd Sound IF	.1Ω	.3Ω	S-23348				
L33	Quadrature Coil	5Ω		S-19030				1480

Note 1: Complete osc. valve assembly part #5-23638.
③ Parallel with 18K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordorson PART No	
L33	170Ω		S-19743	19-1577		6234				Tapped ② 67Ω

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA						
	TOTAL CONNECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT 1000 (^)	ZENITH PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordorson PART No	Triad PART No	
L34	270A	60Ω	1.78Y	95-1376	C-3597 ①	C-2598 ①	C-2528 ①	26C44	C-23X	

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CURRENT	ZENITH PART No	FEDERAL PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No	SARKES TARZIAN PART No	
M1	.270A	212-14	1090A	MR-300	6S300	6Q4	300	
M3	.270A	212-14	1090A	MR-300	6S300	6Q4	300	

FUSES

ITEM No	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No		LITTELFUSE PART No		BUSS PART No	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG 9/B	1/4A 125V	156-32		312.250 (3AG-9/B-1/4A)	357001	MDL 1/4	4405

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA			
		ZENITH PART No.	SYLVANIA PART No.	NOTES	
M4	1N295	103-18	1N90	Video Det. (Pigtail)	

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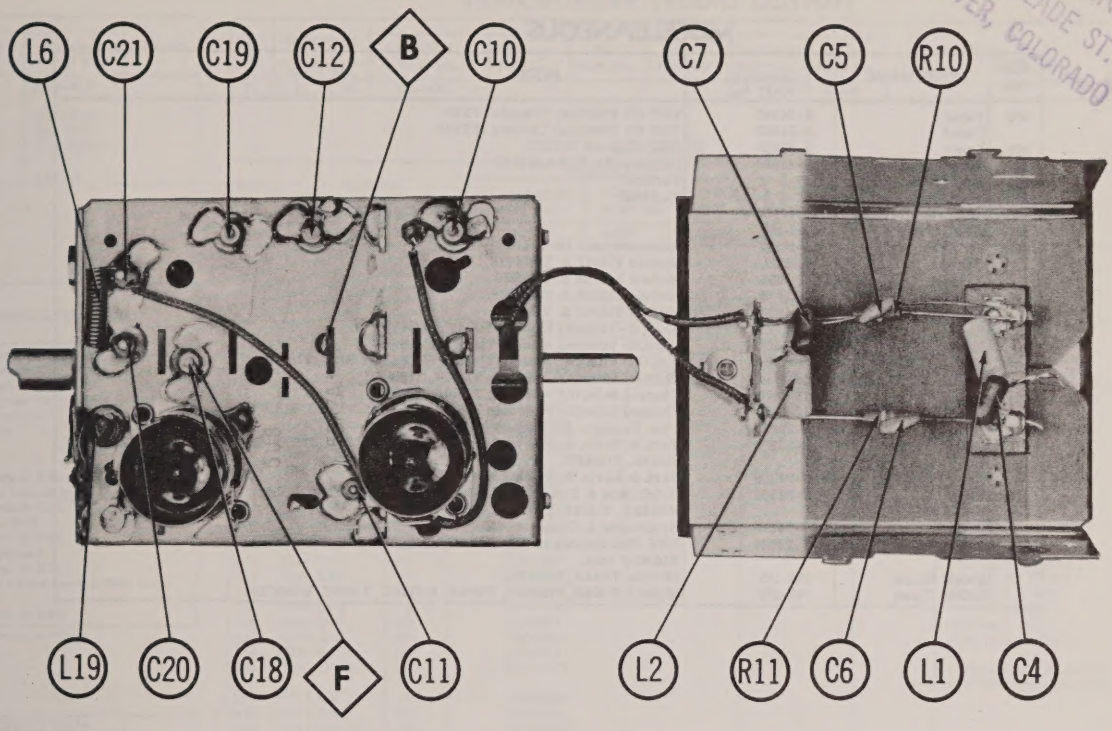
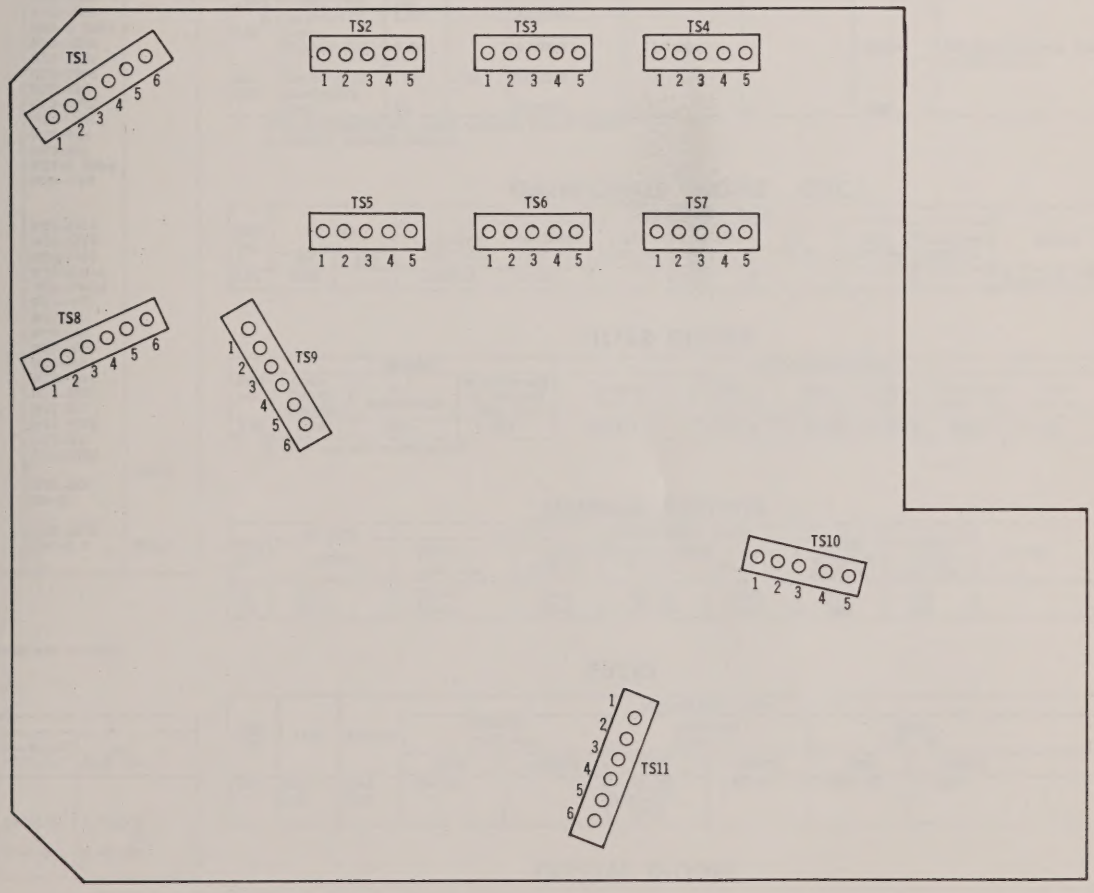


RF TUNER TOP VIEW



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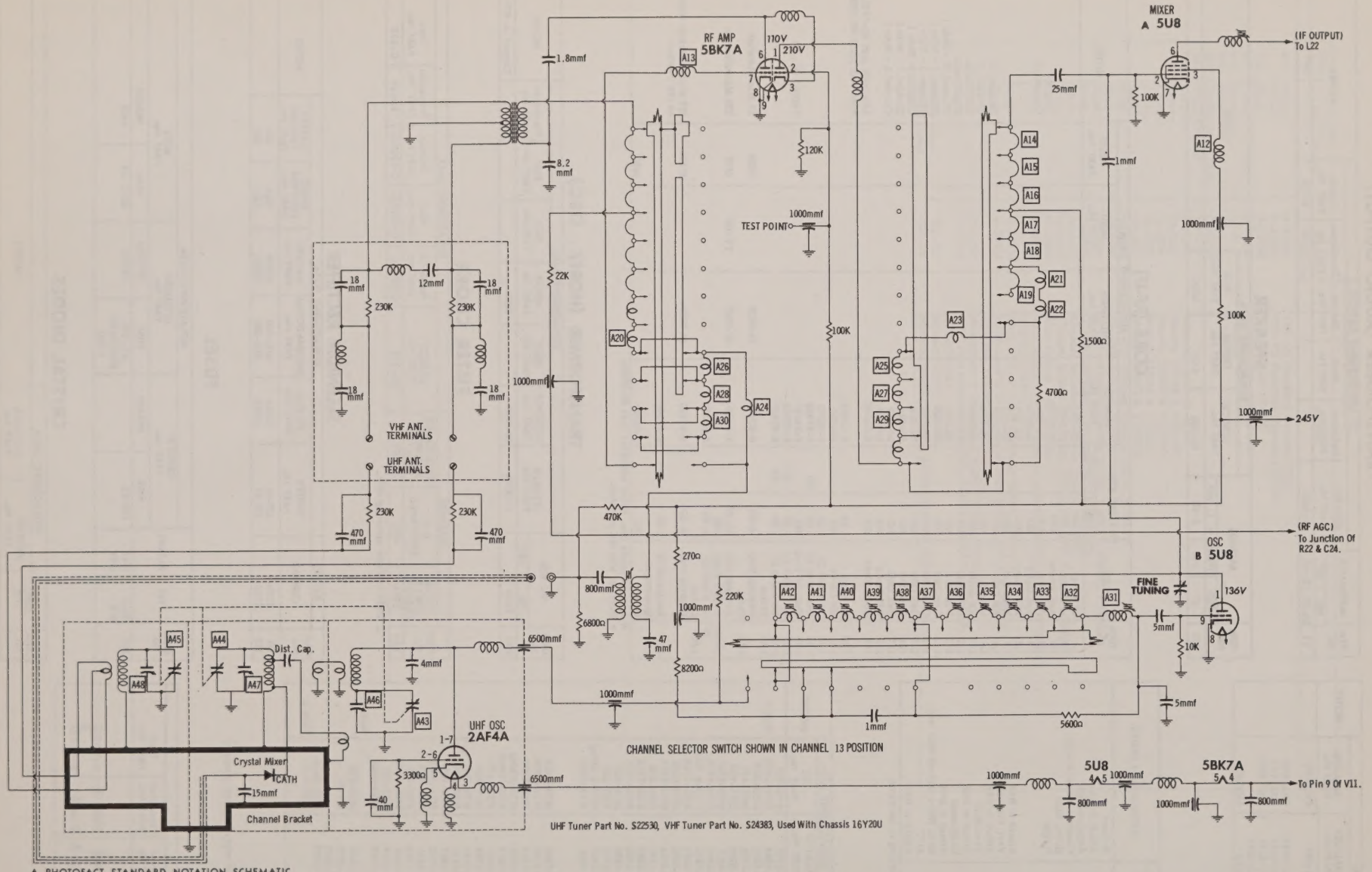

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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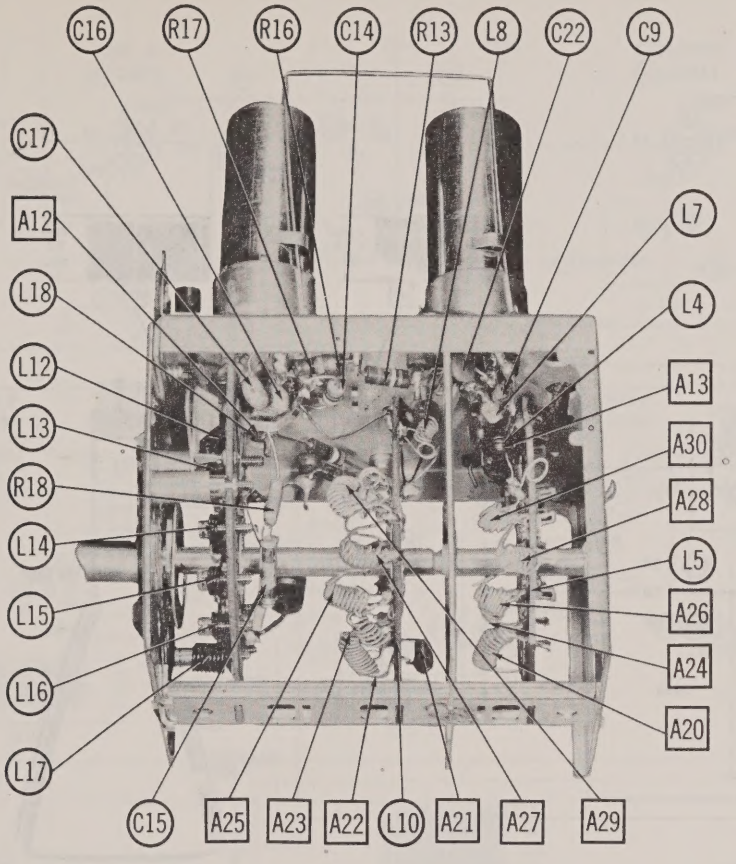
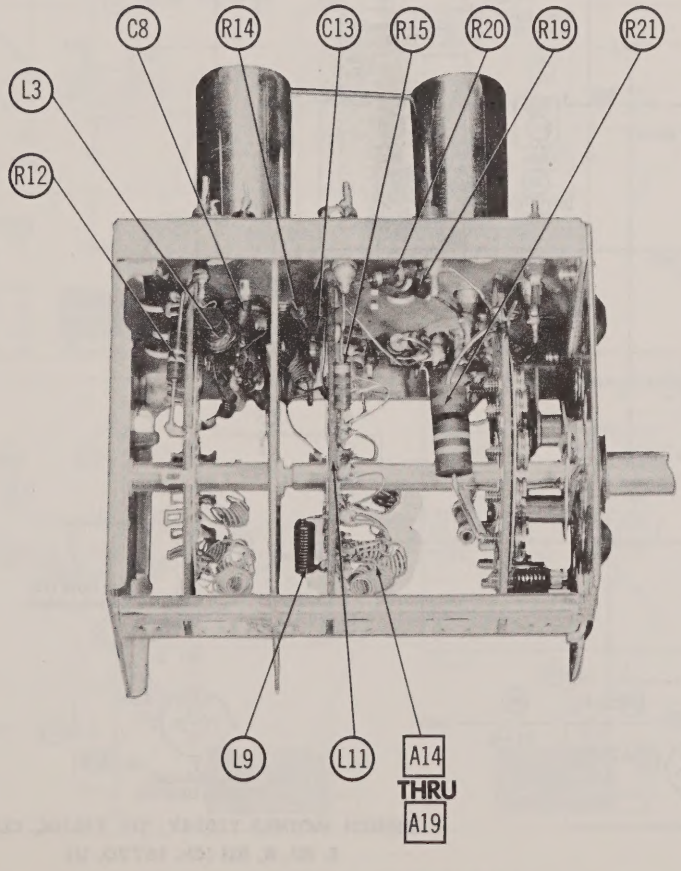
ALTERNATE VHF-UHF TUNER SCHEMATIC



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

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